

# Joint Publication 2-01.3



## Joint Intelligence Preparation of the Operational Environment



16 June 2009



# PREFACE

## 1. Scope

This publication provides doctrine for conducting joint intelligence preparation of the operational environment. It describes the process in which the adversary and other relevant aspects of the operational environment are analyzed to identify possible adversary courses of action and to support joint operation planning, execution, and assessment.

## 2. Purpose

This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff. It sets forth joint doctrine to govern the activities and performance of the Armed Forces of the United States in joint operations and provides the doctrinal basis for interagency coordination and for US military involvement in multinational operations. It provides military guidance for the exercise of authority by combatant commanders and other joint force commanders (JFCs) and prescribes joint doctrine for operations, education, and training. It provides military guidance for use by the Armed Forces in preparing their appropriate plans. It is not the intent of this publication to restrict the authority of the JFC from organizing the force and executing the mission in a manner the JFC deems most appropriate to ensure unity of effort in the accomplishment of the overall objective.

## 3. Application

a. Joint doctrine established in this publication applies to the joint staff, commanders of combatant commands, subunified commands, joint task forces, subordinate components of these commands, and the Services.

b. The guidance in this publication is authoritative; as such, this doctrine will be followed except when, in the judgment of the commander, exceptional circumstances dictate otherwise. If conflicts arise between the contents of this publication and the contents of Service publications, this publication will take precedence unless the Chairman of the Joint Chiefs of Staff, normally in coordination with the other members of the Joint Chiefs of Staff, has provided more current and specific guidance. Commanders of forces operating as part of a multinational (alliance or coalition) military command should follow multinational doctrine and procedures ratified by the United

States. For doctrine and procedures not ratified by the United States, commanders should evaluate and follow the multinational command's doctrine and procedures, where applicable and consistent with US law, regulations, and doctrine.

For the Chairman of the Joint Chiefs of Staff:

A handwritten signature in black ink, reading "Bruce E. Grooms". The signature is fluid and cursive, with the first name "Bruce" being the most prominent.

B. E. GROOMS  
RDML, USN  
Vice Director, Joint Staff

**SUMMARY OF CHANGES**  
**REVISION OF JOINT PUBLICATION 2-01.3**  
**DATED 24 MAY 2000**

- **Provides guidance regarding the establishment, composition, and responsibilities of a joint intelligence preparation of the operational environment (JIPOE) coordination cell at the joint force level.**
- **Emphasizes the need for analyzing relevant political, military, economic, social, information, and infrastructure variables to help describe the impact of the operational environment on mission accomplishment.**
- **Establishes a methodology for node-link analysis to support development of a systems perspective of the operational environment.**
- **Explains how JIPOE products and procedures support joint force operation planning, execution, and assessment.**
- **Describes the JIPOE responsibilities of joint force staff organizations and national intelligence liaison personnel.**
- **Discusses special considerations for conducting JIPOE in support of stability operations and irregular warfare, and to counter adversary use of asymmetric approaches.**
- **Utilizes historical case studies to illustrate JIPOE processes during both traditional and irregular warfare.**
- **Promulgates new definitions for “adversary template,” “adversary capabilities,” and “sociocultural factors.”**

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# TABLE OF CONTENTS

	PAGE
EXECUTIVE SUMMARY .....	xi
CHAPTER I	
AN OVERVIEW OF JOINT INTELLIGENCE PREPARATION OF THE OPERATIONAL ENVIRONMENT	
• Introduction .....	I-1
• The Operational Environment – A Holistic View .....	I-2
• Differences Between Joint Intelligence Preparation of the Operational Environment and Intelligence Preparation of the Battlespace.....	I-4
• Significance to the Joint Intelligence Process .....	I-5
• Organizations, Roles, and Responsibilities .....	I-9
• Interagency and Multinational Considerations .....	I-16
• Joint Intelligence Preparation of the Operational Environment Relationship to the Levels of War .....	I-17
• Considerations Across the Range of Military Operations .....	I-20
CHAPTER II	
THE PROCESS FOR JOINT INTELLIGENCE PREPARATION OF THE OPERATIONAL ENVIRONMENT	
• Introduction .....	II-1
SECTION A. DEFINING THE OPERATIONAL ENVIRONMENT .....	
	II-2
• Overview .....	II-2
• Identifying the Joint Force’s Operational Area .....	II-3
• Analyzing the Mission and Joint Force Commander’s Intent .....	II-4
• Determining the Significant Characteristics of the Operational Environment ....	II-4
• Establishing the Limits of the Joint Force’s Area of Interest .....	II-5
• Determining the Level of Detail Required and Feasible within the Time Available .....	II-7
• Determining Intelligence Gaps, Shortfalls, and Priorities .....	II-8
• Submitting Requests for Information to Support Further Analysis.....	II-8
SECTION B. DESCRIBING THE IMPACT OF THE OPERATIONAL ENVIRONMENT .....	
	II-9
• Overview .....	II-9
• Developing a Geospatial Perspective of the Operational Environment .....	II-10
• Developing a Systems Perspective of the Operational Environment .....	II-44
• Describing the Impact of the Operational Environment on Adversary and Friendly Capabilities and Broad Courses of Action .....	II-54

SECTION C. EVALUATING THE ADVERSARY .....	II-55
• Overview .....	II-55
• Updating or Creating Adversary Models .....	II-56
• Determining the Current Adversary Situation .....	II-62
• Identifying Adversary Capabilities and Vulnerabilities .....	II-64
• Identifying Adversary Centers of Gravity and Decisive Points .....	II-65
 SECTION D. DETERMINING ADVERSARY COURSES OF ACTION .....	 II-68
• Overview .....	II-68
• Identifying the Adversary’s Likely Objectives and Desired End State .....	 II-69
• Identifying the Full Set of Adversary Courses of Action .....	II-70
• Evaluating and Prioritizing Each Course of Action .....	II-71
• Developing Each Course of Action in the Amount of Detail that Time Allows .....	 II-73
• Identifying Initial Collection Requirements .....	II-77
 CHAPTER III SUPPORT TO JOINT OPERATION PLANNING, EXECUTION, AND ASSESSMENT	
• Introduction .....	III-1
 SECTION A. PLANNING .....	 III-1
• Overview .....	III-1
• Initiation .....	III-4
• Mission Analysis .....	III-4
• Course of Action Development .....	III-5
• Course of Action Analysis and Wargaming .....	III-5
• Course of Action Comparison .....	III-9
• Course of Action Approval .....	III-9
• Plan or Order Development .....	III-10
 SECTION B. EXECUTION .....	 III-11
• Overview .....	III-11
• Shape Phase .....	III-13
• Deter Phase .....	III-14
• Seize Initiative Phase .....	III-14
• Dominate Phase .....	III-15
• Stabilize Phase .....	III-15
• Enable Civil Authority Phase .....	III-16
 SECTION C. ASSESSMENT .....	 III-16
• Overview .....	III-16
• Assessment Process .....	III-17

• Support to Assessing Performance .....	III-18
• Support to Assessing Effectiveness .....	III-19

## CHAPTER IV SPECIAL CONSIDERATIONS

• Introduction .....	IV-1
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### SECTION A. SUPPORT DURING STABILITY OPERATIONS AND IRREGULAR WARFARE .....

• Overview .....	IV-1
• Increased Emphasis on Sociocultural Factors .....	IV-2
• Increased Importance of Infrastructure Analysis .....	IV-8
• Heavier Emphasis on Detailed Knowledge .....	IV-8
• Increased Need for Collaboration and Information Sharing .....	IV-11
• Focused Process and Tailored Products .....	IV-11

### SECTION B. COUNTERING ASYMMETRIC APPROACHES .....

• Overview .....	IV-15
• Adversary Measures to Avoid Detection .....	IV-15
• Adversary Use of Information Operations .....	IV-19
• Terrorism .....	IV-21
• Insurgency .....	IV-22
• Actual or Threatened Use of Weapons of Mass Destruction .....	IV-25
• Theater Missiles .....	IV-27

## APPENDIX

A The Leyte Campaign – A Case Study of Support to Major Operations and Campaigns.....	A-1
B Somalia 1992-1993 – A Case Study of Support to Stability Operations and Irregular Warfare .....	B-1
C Analyzing and Depicting a System .....	C-1
D Specialized Products.....	D-1
E References .....	E-1
F Administrative Instructions .....	F-1

## GLOSSARY

Part I Abbreviations and Acronyms .....	GL-1
Part II Terms and Definitions .....	GL-4

## FIGURE

I-1 Holistic View of the Operational Environment .....	I-3
I-2 A Synergistic Integration of Perspectives.....	I-5



I-3	The Intelligence Process .....	I-6
I-4	Joint Intelligence Preparation of the Operational Environment and the Intelligence Estimate .....	I-8
I-5	Joint Intelligence Preparation of the Operational Environment Coordination Cell .....	I-13
II-1	Joint Intelligence Preparation of the Operational Environment – The Process .....	II-1
II-2	Joint Intelligence Preparation of the Operational Environment - Step One.....	II-2
II-3	Joint Intelligence Preparation of the Operational Environment - Step Two.....	II-9
II-4	Constructing a Combined Obstacle Overlay .....	II-12
II-5	Mobility Corridors Grouped to Form Avenues of Approach .....	II-15
II-6	Land Modified Combined Obstacle Overlay .....	II-17
II-7	Maritime Modified Combined Obstacle Overlay .....	II-21
II-8	Air Modified Combined Obstacle Overlay .....	II-25
II-9	Space Modified Combined Obstacle Overlay .....	II-28
II-10	Impact of the Information Environment on Military Operations .....	II-29
II-11	Combined Information Overlay .....	II-33
II-12	Information System Vulnerability Assessment Matrix.....	II-34
II-13	Electromagnetic Modified Combined Obstacle Overlay .....	II-37
II-14	Potential Interference Chart .....	II-38
II-15	Effects of Weather on Military Operations.....	II-41
II-16	Systems Perspective of the Operational Environment .....	II-45
II-17	Systems Nodes and Links .....	II-46
II-18	The Breadth and Depth of a Systems Perspective .....	II-49
II-19	Example of a Network Analysis Diagram .....	II-51
II-20	Measures of Node Centrality .....	II-52
II-21	Joint Intelligence Preparation of the Operational Environment – Step Three .....	II-55
II-22	Ground and Air Adversary Template .....	II-57
II-23	Naval Adversary Template .....	II-58
II-24	Systems Perspective Adversary Template .....	II-59
II-25	Time Event Matrix .....	II-61
II-26	Target Value Matrix .....	II-63
II-27	Characteristics of Centers of Gravity.....	II-66
II-28	Analyzing Critical Factors .....	II-67
II-29	Joint Intelligence Preparation of the Operational Environment – Step Four.....	II-69
II-30	Constructing a Situation Template .....	II-74
II-31	Geospatial Situation Template .....	II-75
II-32	Systems Situation Template .....	II-76
II-33	Situation Matrix .....	II-77
II-34	Constructing an Event Template.....	II-78
II-35	Event Template .....	II-79
II-36	Constructing an Event Matrix .....	II-80

II-37	Event Matrix .....	II-81
III-1	Support to Joint Operation Planning .....	III-2
III-2	Decision Support Template .....	III-8
III-3	Intelligence Synchronization Matrix .....	III-11
III-4	Support to Joint Operation Execution .....	III-12
III-5	Assessment Levels and Measures .....	III-17
IV-1	Mapping Human Factors.....	IV-10
IV-2	Support to Countering Asymmetric Approaches .....	IV-16
A-1	Pacific Theater Situation September 1944 .....	A-1
A-2	Modified Combined Obstacle Overlay for Philippines.....	A-4
A-3	Modified Combined Obstacle Overlay for Leyte.....	A-5
A-4	Japanese Force Situation October 1944 .....	A-7
A-5	Situation Template for Course of Action 1 (Defense of Leyte) .....	A-8
A-6	Situation Template for Course of Action 2 (Reinforcement of Leyte) .....	A-9
A-7	Situation Template for Course of Action 3 (Decisive Attack) .....	A-10
A-8	Situation Template for Course of Action 4 (Withdrawal from Leyte) .....	A-11
A-9	Japanese Course of Action Matrix .....	A-12
A-10	Leyte Event Template .....	A-14
A-11	Leyte Event Matrix .....	A-15
A-12	Leyte Gulf Situation October 1944 .....	A-16
B-1	Internally Displaced Persons Camp Locations.....	B-3
B-2	Somalia/United States Size Comparison.....	B-4
B-3	Southern Somalia Road Infrastructure .....	B-6
B-4	Mogadishu Port .....	B-7
B-5	Airfields and Ports.....	B-9
B-6	Somalia Seasons.....	B-10
B-7	Somali Clan Structure .....	B-12
B-8	Consolidated Systems Overlay.....	B-13
B-9	Somali Warring Factions .....	B-14
B-10	Systems Perspective Adversary Template .....	B-16
B-11	Map of Mogadishu .....	B-17
B-12	Mogadishu Land Use Overlay .....	B-17
B-13	Mogadishu Faction Control Overlay .....	B-18
B-14	Mogadishu Transportation Overlay .....	B-18
B-15	Mogadishu Information Environment Overlay.....	B-19
B-16	Mogadishu International Presence Overlay .....	B-19
B-17	Center of Gravity Analysis .....	B-20
B-18	Adversary Potential Courses of Action.....	B-21
B-19	Systems Situation Template for Course of Action One - Militias Acquiesce .....	B-23
B-20	System Situation Template for Course of Action Two - Some Militias Oppose.....	B-24
B-21	Systems Situation Template for Course of Action Three - Widespread Civil War.....	B-25
B-22	Systems Situation Template for Course of Action Four - Islamic Jihad .....	B-26

B-23 Systems Event Template.....	B-27
B-24 Event Matrix .....	B-28
B-25 Systems Network Analysis Diagram .....	B-30
C-1 Narcotics Network Analysis - 1 .....	C-3
C-2 Narcotics Network Analysis - 2 .....	C-4
C-3 Narcotics Network Analysis - 3 .....	C-5
C-4 Narcotics Network Analysis - 4 .....	C-6
C-5 Narcotics Network Analysis - 5 .....	C-8
C-6 Narcotics Network Analysis - 6 .....	C-9
C-7 Political Subsystems.....	C-11
C-8 Military Subsystems.....	C-12
C-9 Economic Subsystems .....	C-13
C-10 Social Subsystems.....	C-14
C-11 Infrastructure Subsystems.....	C-16
C-12 Information Subsystems.....	C-17
D-1 Infrastructure Overlay .....	D-1
D-2 Primary and Secondary Route Overlay .....	D-2
D-3 Pattern Analysis Plot Sheet .....	D-3
D-4 Quarantine Overlay .....	D-4
D-5 Population Support Overlay .....	D-5
D-6 Legal Status Overlay .....	D-6
D-7 Ethnicity Overlay .....	D-7
D-8 Perceptions Assessment Matrix .....	D-8
D-9 Activities Matrix.....	D-9
D-10 Association Matrix.....	D-10
D-11 Link Diagram .....	D-11

## EXECUTIVE SUMMARY COMMANDER'S OVERVIEW

- Provide an Overview of Joint Intelligence Preparation of the Operational Environment (JIPOE)
  - Discuss the Process for JIPOE
  - Discuss Support to Joint Operation Planning, Execution, and Assessment
  - Discuss Special Considerations
  - Provide Case Studies of Support to Major Operations, Campaigns, Stability Operations, and Irregular Warfare
  - Describe Analyzing and Depicting a System and Specialized Products
- 

### Overview

*The purpose of joint intelligence preparation of the operational environment (JIPOE) is to support the joint force commander (JFC) by determining the adversary's probable intent and most likely courses of action (COAs) for countering the overall friendly joint mission.*

Joint intelligence preparation of the operational environment (JIPOE) is the analytical process used by joint intelligence organizations to produce intelligence assessments, estimates, and other intelligence products in support of the joint force commander's (JFC's) decision-making process. It is a continuous process that involves four major steps: defining the total operational environment; describing the impact of the operational environment; evaluating the adversary; and determining and describing adversary potential courses of action (COAs), particularly the adversary's most likely COA and the COA most dangerous to friendly forces and mission accomplishment. The JIPOE process assists JFCs and their staffs in achieving information superiority by identifying adversary centers of gravity (COGs), focusing intelligence collection at the right time and place, and analyzing the impact of the operational environment on military operations.

The operational environment is the composite of the conditions, circumstances, and influences that affect the employment of capabilities and bear on the decisions of the commander. Understanding the operational environment is fundamental to identifying the conditions required to achieve stated objectives; avoiding the effects that may hinder mission accomplishment (undesired effects); and assessing the impact of friendly, adversary, and other actors, as well

as the local populace, on the commander's concept of operations (CONOPS) and progress toward attaining the military end state.

*A holistic view of the operational environment helps create analytic synergy.*

A holistic view of the operational environment encompasses **physical areas and factors**, and the **information environment**.

The **physical areas** include the assigned operational area and the associated areas of influence and interest necessary for the conduct of operations within the air, land, maritime, and space domains.

These domains include numerous **factors** the JFC and staff must consider. Some factors exert direct or indirect influence throughout all aspects of the operational environment. These other factors help compose a holistic view of the operational environment and include weather and climate, sociocultural factors, and time as it relates to an adversary's ability to decide and react. In some types of operations, such as foreign humanitarian assistance, counterinsurgency, and nation assistance, some of these factors reach critical importance.

The **information environment** is the aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information. It is made up of three interrelated dimensions: physical, informational, and cognitive.

*A systems perspective helps identify potential sources for indications and warning; facilitates understanding friendly, adversary, and neutral system interactions; and facilitates identification and use of decisive points, lines of operations, and other design elements.*

A systems perspective of the operational environment strives to provide an understanding of significant relationships within interrelated political, military, economic, social, information, infrastructure, and other systems relevant to a specific joint operation. Among other benefits, this *perspective* helps intelligence analysts identify potential sources from which to gain indications and warning, and facilitates understanding the continuous and complex interaction of friendly, adversary, and neutral systems. This *understanding* facilitates the identification and use of decisive points, lines of operations, and other design elements, and allows commanders and staffs to consider a broader set of options to focus limited resources, create desired effects, and achieve objectives.

*This understanding of systems allows commanders and staffs to consider a broader set of options to focus limited resources, create desired effects, and achieve objectives.*

JIPOE and intelligence preparation of the battlespace (IPB) products generally differ in terms of their relative purpose, focus, and level of detail. During operational-level, force-on-force confrontations, JIPOE utilizes a macro-analytic approach that seeks to identify an adversary's strategic vulnerabilities and COGs, whereas IPB generally requires microanalysis and a finer degree of detail in order to support component command operations. But in some situations both JIPOE and IPB will require the highest possible level of detail.

The JIPOE process emphasizes a *holistic* approach which that helps JIPOE analysts assess the adversary's diplomatic, informational, military, and economic options; provides a methodology for refining the assessment of the adversary's military option; for hypothesizing the adversary's most likely and most dangerous COAs; and identifying the adversary's most likely CONOPS.

*JIPOE is a holistic and dynamic process that both supports and is supported by the intelligence process.*

JIPOE is a dynamic process that both supports, and is supported by, each of the categories of intelligence operations that comprise the intelligence process.

In the category of **intelligence planning and direction**, the JIPOE process provides the basic data and assumptions regarding the adversary and other relevant aspects of the operational environment that help the JFC and staff identify intelligence requirements, information requirements, and collection requirements.

In **intelligence collection**, JIPOE provides the foundation for the development of an optimal intelligence collection strategy by enabling analysts to identify the time, location, and type of anticipated adversary activity corresponding to each potential adversary COA.

In **processing and exploitation**, the JIPOE process provides a disciplined yet dynamic time phased methodology for optimizing the processing and exploiting of large amounts of data.

In **analysis and production**, JIPOE products provide the foundation for the intelligence directorate of a joint staff's (J-2's) intelligence estimate.

In **dissemination and integration**, the J-2's intelligence estimate provides vital information that is required by the joint force staff to complete their estimates, and for subordinate commanders to continue concurrent planning activities.

And in **evaluation and feedback**, the J-2 staff continuously evaluates JIPOE products to ensure that they achieve and maintain the highest possible standards of intelligence excellence.

*Organizations across the Department of Defense and throughout each level of joint command contribute to training, equipping, tasking, standardizing, guiding, analyzing, producing, exploiting, managing, integrating, and synchronizing for JIPOE.*

There are many organizations with roles and responsibility in JIPOE. The **Services** are responsible for training Service personnel in JIPOE and IPB techniques, equipping their forces with the materiel needed to conduct IPB and dissemination of IPB products. **The Defense Intelligence Agency Defense Intelligence Operations Coordination Center** is the focal point for tasking the production of baseline strategic intelligence analysis in support of current and planned joint operations. **Combatant commanders (CCDRs)** are responsible for ensuring the standardization of JIPOE products, establishing theater procedures for collection management, and the production and dissemination of intelligence products. The **J-2** has the primary staff responsibility for planning, coordinating, and conducting the overall JIPOE analysis and production effort at the joint force level. The combatant command **joint intelligence operations center (JIOC)** is the focal point for the overall JIPOE analysis and production effort within the combatant command, for managing collection requirements related to JIPOE and IPB efforts, and for producing intelligence products for the CCDR and subordinate commanders that support joint operations. The **subordinate JFCs** clearly state their objectives, CONOPS, and operation planning guidance to their staffs and ensure that the staff fully understands their intent. **Joint task force (JTF) joint intelligence support element or JTF joint intelligence operations center (JIOC)** is the intelligence organization at the JTF level responsible for complete air, space, ground, and maritime order of battle analysis; identification of adversary COGs; analysis of command and control (C2) and communications systems, targeting support; collection management; and maintenance of a 24-hour



watch in a full JIPOE effort. The JIOC must proactively seek out and exploit all possible assistance from interagency and multinational sources. The **joint geospatial intelligence cell** will manage the framework for accessing authoritative geospatial intelligence data. Intelligence staffs of **subordinate component commands** should ensure that appropriate IPB products are prepared for each domain in which the component command operates. The JFC may organize a “**JIPOE coordination cell**” (or similarly-named entity) to assist in integrating and synchronizing the JIPOE effort.

*Multinational and interagency considerations will normally drive joint force expertise requirements in order to create a holistic view of the operational environment and to develop a systems perspective and understanding.*

Due to the breadth of required subject matter expertise, a comprehensive JIPOE effort based on a holistic view of the operational environment will normally require expertise beyond the capabilities of the joint force JIOC and subordinate components. In particular, the development of a systems perspective will usually require assistance from, or collaboration with, national-level subject matter experts, both within and outside Department of Defense. Whenever possible within security guidelines, the JIPOE effort should include participation by the host nation (HN), allies, and coalition partners. A multinational JIPOE effort requires interoperable geospatial intelligence (GEOINT) data, applications, and data exchange capabilities. Information exchange throughout the operational area for the purpose of fostering mutual interests in resolving or deterring conflict or providing support is highly beneficial to all concerned parties.

*Specific JIPOE planning considerations vary considerably in relationship to the levels of war and across the range of military operations.*

Specific JIPOE planning considerations may vary considerably between strategic, operational, and tactical levels. Strategic-level JIPOE must examine the instruments of national power: diplomatic, informational, military, and economic. The operational level is concerned with analyzing the operational area, facilitating the flow of friendly forces in a timely manner, sustaining those forces, and then integrating tactical capabilities at the decisive time and place. Tactical operations generally require a greater level of detail over a smaller segment of the operational environment than is required at the strategic and operational levels. Under certain circumstances tactical operations can assume strategic importance and may constitute a critical part of joint operations.



Joint forces conduct JIPOE to develop a holistic view of the operational environment and assess adversary potential COAs. Since potential adversaries have access to US doctrine, they will probably attempt to exploit the JIPOE process, either through deception or by deliberately adopting a COA different than the one the JIPOE analyst might normally identify as “most likely.” Operation planning based solely on countering the most likely COA will leave the joint force vulnerable to other less likely COAs that the adversary may choose to adopt in order to maximize surprise.

### The Joint Intelligence Preparation of the Operational Environment Process

*The JIPOE process - defining the operational environment, describing the impact of the operational environment, evaluating the adversary, and determining adversary COAs - provides a disciplined methodology for applying a holistic view of the operational environment to the analysis of adversary capability and intent.*

The JIPOE process provides a disciplined methodology for applying a holistic view of the operational environment to the analysis of adversary capabilities and intentions. This process consists of four basic steps that ensure the systematic analysis of **all** relevant aspects of the operational environment. The basic process remains the same throughout the range of military operations.

In the *first step* of the JIPOE process, **defining the operational environment**, the joint force staff assists the JFC and component commanders in defining the operational environment by identifying those aspects and significant characteristics that may be relevant to the joint force’s mission. Successfully defining the command’s operational environment is critical to the outcome of the JIPOE process. Failure to focus on the *relevant* characteristics of the operational environment leads to wasted time and effort.

*Successfully defining the command’s operational environment is critical to the outcome of the JIPOE process.*

To define the operational environment, there are seven elements. In the first, you **identify the joint force’s operational area**. JFCs may define operational areas to assist in the coordination and deconfliction of joint action. Geographic combatant commanders (GCCs) may designate theaters of war and subordinate theaters of operation for each major threat when warranted. For operations somewhat limited in scope and duration, GCCs can designate operational areas such as joint operations areas, joint special operations areas, joint

security areas, amphibious objective areas, or areas of operations.

Element two is **analyze the mission and joint force commander's intent**. The JFC's stated intent and all characteristics of the mission that could influence the JFC's decisions or affect the COAs available to the joint force or the adversary are of special significance. The analyst must also consider the operational limitations levied upon the JFC by the national military leadership which would impact the conduct of operations.

Element three, **determine the significant characteristics of the operational environment**, consists of a *cursory* examination of each aspect of the operational environment in order to identify those characteristics of *possible* significance or relevance to the joint force and its mission.

Element four is **establish the limits of the joint force's areas of interest**. The JFC and J-2 should identify and establish limits for those physical areas and nonphysical aspects of the operational environment that are deemed relevant to the JIPOE effort.

Element five is **determine the level of detail required and feasible within the time available**. The J-2 plans, prioritizes, and structures the JIPOE effort by balancing the level of detail required with the amount of time available.

Element six is **determine intelligence and information gaps, shortfalls, and priorities**. The J-2 staff evaluates the available intelligence and information databases to determine if the necessary information is available to conduct the remainder of the JIPOE process. The J-2 will use the JFC's stated intent, commander's critical information requirements, and initial priority intelligence requirement to establish priorities for intelligence collection, processing, production, and dissemination.

And element seven is **collect material and submit requests for information to support further analysis**. The J-2 staff initiates collection operations

and issues requests for information to fill intelligence gaps to the level of detail required to support the JIPOE effort. If any assumptions are repudiated by new intelligence, the commander, the operations directorate of a joint staff (J-3), and other appropriate staff elements should reexamine any evaluations and decisions that were based on those assumptions.

*Describing the impact of the operational environment enables evaluation of that environment from the adversary's perspective, and expresses it in terms of a prioritized set of likely adversary military COAs.*

In the *second step* of the JIPOE process, **describe the impact of the operational environment**, the joint force evaluates the impact of the operational environment on adversary, friendly, and neutral military capabilities and broad COAs. All relevant physical and nonphysical aspects of the operational environment are analyzed by JIPOE analysts, combatant command personnel, and GEOINT analysts to produce a geospatial perspective and develop a systems perspective through the analysis of relevant sociocultural factors and system/subsystem nodes and links.

To describe the impact of the operational environment, there are three elements. First, **develop a geospatial perspective of the operational environment**. Each aspect of the operational environment is assessed to *analyze* its relevant characteristics and *evaluate* its potential impact on military operations in the land domain, the maritime domain, the air domain, the space domain, the information environment, and other relevant aspects (such as electromagnetic spectrum, weather, climate, sociocultural factors, and country/group characteristics).

Element two is **develop a systems perspective of the operational environment**. Understanding the operational environment's systems and their interaction can help visualize and describe how military actions can affect other partners as well as how those partners' actions can affect the JFC's operations, facilitate collaboration with counterparts from other agencies and organizations and help influence actions that are beyond the JFC's directive authority. JIPOE analysts develop a systems perspective through the identification and analysis of all major elements within friendly, adversary, or neutral systems and subsystems that are potentially relevant to the success of a joint

operation. Understanding the interaction of these systems with each other and how their relationships will change over time can help the JFC visualize how joint force actions on one system can affect other systems.

And element three is **describe the impact of the operational environment on adversary and friendly capabilities and broad courses of action.** Evaluations of all the individual aspects of the operational environment and the systems perspective are ultimately combined into a single integrated assessment designed to support the development and evaluation of friendly joint COAs. Likewise, the product enables the J-2 to evaluate the operational environment from the adversary's perspective, and to express this evaluation in terms of a prioritized set of adversary military COAs, based on how well each is supported by the overall impact of the operational environment to include any related diplomatic, informational, or economic options.

*Understanding the relationship between adversary centers of gravity (COGs), critical capability, requirements, and vulnerability illuminates which decisive points offer opportunity to attack the adversary's COGs indirectly, extend friendly operational reach, or enable the application of friendly forces and capabilities.*

The *third step* in the JIPOE process, **evaluating the adversary**, identifies and evaluates the adversary's capabilities and limitations, current situation, COGs, and the doctrine, patterns of operation, and tactics, techniques, and procedures employed by adversary forces, absent those constraints identified during step two. The JIPOE analyst must take care not to evaluate the adversary's joint capabilities by mirror-imaging US joint and Service doctrine. In many cases the joint doctrine of potential adversaries may be embryonic or nonexistent.

To evaluate the adversary, there are four elements. First, **update or create adversary models.** Adversary models can depict either an opponent's doctrinal way of operating or their observed patterns of operation under similar conditions. The models consist of three major parts: graphical depictions of adversary patterns of operations related to specific COAs; descriptions of the adversary's preferred tactics and options; and lists of high-value targets.

The second element is to **determine the current adversary situation.** All available intelligence

sources, methods, and databases should be continuously exploited in an effort to analyze and determine the current adversary situation. Current information pertaining to the composition and disposition of adversary forces is particularly important. The current adversary situation is based on assessments of these order-of-battle factors: composition, disposition strength, tactics-techniques-procedure, training status, logistics, effectiveness, electronic technical data, personalities, and information that contributes to knowledge.

The third element is to **identify adversary capabilities and vulnerabilities**. Adversary capabilities are expressed in terms of the broad COAs and supporting operations that the adversary can take to interfere with the accomplishment of the friendly mission. In conventional operations, these are generally defined as offense, defense, reinforcement, and retrograde. Adversary capabilities are determined by comparing the current adversary situation with each of the adversary models already constructed. The J-2 should disseminate the evaluation of adversary capabilities, strengths, and weaknesses to the other joint force staff sections as soon as possible.

Finally, the fourth element is to **identify adversary COGs**. One of the most important tasks is the identification of adversary COGs or the source of power that provides moral or physical strength, freedom of action, and will to act. JIPOE analysts continuously assess the adversary's leadership, fielded forces, resources, infrastructure, population, transportation systems, and internal and external relationships to determine from which elements the adversary derives freedom of action, physical strength, or the will to fight. Understanding the relationship between a COG's critical capabilities, requirements, and vulnerabilities can illuminate decisive points. A decisive point is a geographic place, specific key event, critical factor, or function that, when acted upon, allows a commander to gain a marked advantage over an adversary or contributes materially to achieving success. JIPOE analysts should identify and study potential decisive points and determine which of them offer the best opportunity to attack the adversary's

COGs indirectly, extend friendly operational reach, or enable the application of friendly forces and capabilities.

*Determining adversary COAs develops a detailed understanding of the adversary's probable intent and future strategy so that joint forces can predict specific activities which, when observed, will reveal the COA the adversary has adopted.*

The *fourth step* in the JIPOE process, **determining adversary COAs**, builds upon this holistic view to develop a detailed understanding of the adversary's probable intent and future strategy. The process provides a disciplined methodology for analyzing the set of potential adversary COAs in order to identify the COA the adversary is most likely to adopt, and the COA that would be most dangerous to the friendly force or to mission accomplishment.

In determining adversary COAs, there are five elements. First, **identify the adversary's likely objectives and desired end state**. The likely objectives and desired end state are identified by analyzing the current adversary military and political situation, strategic and operational capabilities, and the sociocultural characteristics of the adversary.

Element two is to **identify the full set of adversary COAs**. At a minimum this list will include all COAs that the adversary's doctrine or pattern of operations indicates are appropriate; all adversary COAs that could significantly influence the friendly mission; and all adversary COAs indicated by recent activities or events. Each identified COA should meet the five criteria of suitability, feasibility, acceptability, uniqueness, and consistency with adversary doctrine or patterns of operation.

Element three is to **evaluate and prioritize each COA**. The full set of identified adversary COAs are evaluated and ranked according to their likely order of adoption. Caution should be exercised to remember that these COAs are only estimates of an adversary's intentions, not facts. It should also be kept in mind that actions associated with a friendly COA may cause the adversary to change to a different COA than the one originally adopted. The JIPOE analyst must also be constantly on guard against possible adversary deception efforts.

Element four is to **develop each COA in the amount of detail time allows.** Each adversary COA is developed in sufficient detail to describe: the type of military operation; the earliest time military action could commence; the location of the action and objectives that make up the COA; the operation plan; and the objective or desired end state.

Element five is to **identify initial collection requirements.** The identification of initial intelligence collection requirements depends on the prediction of specific activities and the areas in which they are expected to occur which, when observed, will reveal which COA the adversary has adopted.

### **Support To Joint Operation Planning, Execution, And Assessment**

*The purpose of JIPOE is to support the JFC by determining the adversary's probable intent and most likely COA for countering the overall friendly joint mission.*

The primary purpose of JIPOE is to support joint operation planning, execution, and assessment by identifying, analyzing, and assessing the adversary's COGs, critical vulnerabilities, capabilities, decisive points, limitations, intentions, COAs, and reactions to friendly operations based on a holistic view of the operational environment. JIPOE analysis assists the JFC and joint force staff to visualize and understand the full range of adversary capabilities and intentions.

*JIPOE is both supported by and supports the joint operation planning process.*

JIPOE supports joint operation planning by identifying significant facts and assumptions about the operational environment. JIPOE products are used by the JFC to produce the commander's estimate of the situation and CONOPS, and by the joint force staff to produce their respective staff estimates. JIPOE products also help to provide the framework used by the joint force staff to develop, wargame, and compare friendly COAs and provide a foundation for the JFC's decision regarding which friendly COA to adopt. JIPOE support is crucial throughout the steps of the joint operation planning process (JOPP). The JIPOE effort should facilitate parallel planning by all strategic, operational, and tactical units involved in the operation.

JIPOE products facilitate operation planning by determining the idiosyncrasies and decision-making patterns of the adversary strategic leadership and field



commanders; the adversary's strategy, intention, or strategic concept of operations; the composition, dispositions, movements, strengths, doctrine, tactics, training, and combat effectiveness of major adversary forces; the adversary's principal strategic and operational objectives and lines of operation; the adversary's strategic and operational sustainment capabilities; COGs and decisive points throughout the adversary's operational and strategic depths; the adversary's ability to conduct information operations (IO) and use or access data from all systems; the adversary's regional strategic vulnerabilities; the adversary's capability to conduct asymmetric attacks against friendly global critical support nodes; the adversary's relationship with possible allies and the ability to enlist their support; the adversary's defensive and offensive vulnerabilities in depth; the adversary's capability to operate advanced warfighting systems in adverse meteorological and oceanographic conditions; and key nodes, links, and exploitable vulnerabilities within an adversary system.

JOPP begins when an appropriate authority recognizes a potential for military capability to be employed in response to a potential or actual crisis. A preliminary or abbreviated pertaining to potential should precede and inform the initiation phase of joint operation planning.

***JIPOE supports initiation of joint operation planning by analysis of contingencies and the characteristics of the operational environment.***

In order for the joint force staff to identify potential COAs, the JFC must formulate planning guidance based on an analysis of the friendly mission. JIPOE supports mission analysis by enabling the JFC and joint force staff to visualize the full extent of the operational environment, to distinguish the known from the unknown, and to establish working assumptions regarding how adversary and friendly forces will interact within the constraints of the operational environment. JIPOE assists JFCs in formulating their planning guidance by identifying significant adversary capabilities and by pointing out critical factors, such as the locations of key geography, attitudes of indigenous populations, and potential land, air, and sea avenues of approach.

***JIPOE supports mission analysis by assisting JFCs***

The J-3 and the plans directorate of a joint staff (J-5) develop friendly COAs designed to accomplish the



*in formulating their planning guidance.*

*JIPOE supports friendly COA development by determining adversary COAs, evaluating the adversary, analyzing the adversary situation, and evaluating other relevant aspects of the operational environment.*

*JIPOE supports analyzing friendly COAs through wargaming and construction of decision support templates.*

*JIPOE supports COA comparison by assessing the overall capabilities of intelligence collection and production to support each friendly COA.*

joint force's mission within the guidelines established by the JFC. The J-2 facilitates this process by ensuring that all adversary COAs are identified, evaluated, and prioritized (JIPOE step four) in sufficient time to be integrated into the friendly COA development effort. Additionally, the evaluation of the adversary (JIPOE step three) is used by the J-3 and J-5 to estimate force ratios. The J-3 also depends heavily on JIPOE products prepared during the analysis of the adversary situation and the evaluation of other relevant aspects of the operational environment in order to formulate initial friendly force dispositions and schemes of maneuver. Additionally, the JIPOE analysis of high-value targets is used by the J-3 and J-5 to identify targets whose loss to the adversary would significantly contribute to the success of a friendly COA. These targets are refined through wargaming and are designated as high-payoff targets. JIPOE also provides significant input to the formulation of deception plans by analyzing adversary intelligence collection capabilities and the perceptual biases of adversary decision makers.

All joint force staff sections participate in an analysis of the friendly COAs to identify any aspects of a particular COA that would make it infeasible, and to determine which COA best accomplishes the joint force's mission. The best method of analyzing friendly COAs is through wargaming and the construction of a decision support template.

Following wargaming, the staff compares friendly COAs to identify the one that has the highest probability of success against the full set of adversary COAs as depicted on the decision support template.

After comparing friendly COAs, each joint force staff element presents its findings to the remainder of the staff. Together they determine which friendly COA they will recommend to the JFC. The J-3 then briefs the COAs to the JFC using graphic aids, such as the decision support template and matrix. The JFC decides upon a COA and announces the CONOPS.

Using the results of wargaming associated with the selected COA, the joint force staff prepares plans and orders that implement the JFC's decision. The J-2 prioritizes intelligence requirements and synchronizes intelligence collection requirements to support the COA selected by the JFC.

*JIPOE supports plan or order development by prioritizing intelligence requirements and synchronizing intelligence collection requirements.*

Execution begins when the President decides to use a military option to resolve a crisis. Execution continues until the operation is terminated or the mission is accomplished or revised. JIPOE support is a particularly important prerequisite for military success throughout all phases of a joint operation regardless of how the battle evolves. The purpose of phasing is to help the JFC organize operations by integrating and synchronizing subordinate operations. During execution, the JIPOE effort must stay at least one step ahead of operations by simultaneously supporting the current phase of the operation *and* laying the informational groundwork required for subsequent phases. JIPOE also supports operation order execution by continuously identifying and evaluating the adversary's strategic and operational COGs.

*JIPOE supports operation order execution by continuously identifying and evaluating adversary strategic and operational COGs.*

Before committing forces, JFCs are able to take actions to help shape the character of potential future operations. Intelligence activities conducted during the shaping phase help lay the groundwork for the JIPOE effort in all subsequent phases of the operation. Specifically, the JIPOE effort during the shaping phase should focus on initial target development resulting in target lists and target material production, identification of adversary COGs, vulnerabilities and susceptibilities to IO, key nodes, line of communications, and potential adversary COAs that would deny friendly access to bases and lodgment areas. Whenever possible, HN and multinational participation in the JIPOE effort should be encouraged.

*JIPOE supports shaping in initial target development.*

*JIPOE supports the current phase of a joint operation while simultaneously laying the informational groundwork required for subsequent phases.*

During the deter phase, the ongoing JIPOE effort is accelerated to focus on monitoring the current situation while simultaneously assessing adversary capabilities to affect subsequent phases of the operation. JIPOE efforts also concentrate on confirming adversary COGs and support the continuous refinement of estimates of adversary capabilities, dispositions, intentions, and

*JIPOE supports the deter phase by monitoring the current situation and assessing adversary capabilities to affect subsequent phases of the operation.*

probable COAs within the context of the current situation. JIPOE analysts must look ahead to prepare threat assessments that support planning for operations in subsequent phases.

*JIPOE supports seizing the initiative with focus on adversary capabilities, intelligence collection planning, and the formulation of an optimal intelligence, surveillance, and reconnaissance strategy.*

As operations commence, the JFC needs to exploit friendly asymmetric advantages and capabilities to shock, demoralize, and disrupt the enemy immediately. The JFC seeks decisive advantage through the use of all available elements of combat power to seize and maintain the initiative, deny the enemy the opportunity to achieve its objectives, and generate in the enemy a sense of inevitable failure and defeat. During this phase, JIPOE analysts focus on adversary capabilities that may impede friendly force deployment from bases to ports of embarkation to lodgment areas. The JIPOE effort is also crucial to intelligence collection planning and the formulation of an optimal intelligence, surveillance, and reconnaissance (ISR) strategy.

*JIPOE supports the dominate phase with linear and nonlinear operations support and assessments of an enemy's capability, willingness, and intent to employ weapons of mass destruction.*

During the dominate phase, JFCs conduct sustained combat operations by simultaneously employing conventional, special operations forces, and IO capabilities throughout the breadth and depth of the operational area. During this phase, the JIPOE effort must be equally prepared to support linear and nonlinear operations. JIPOE also provides JFCs and component commanders with assessments of an enemy's capability, willingness, and intent to employ weapons of mass destruction (WMD).

*JIPOE supports the stabilization phase by focusing on actual or potential threats to the joint force.*

Stabilization typically begins with significant military involvement to include some combat, then moves increasingly toward enabling civil authority as the threat wanes and civil infrastructures are reestablished. During the stabilize phase, the JIPOE effort transitions from supporting combat operations to focus on actual or potential threats to the joint force.

*JIPOE supports the enable civil authority phase by collecting intelligence lessons learned and archiving its products.*

Finally, the enable civil authority phase is characterized by the establishment of a legitimate civil authority that is enabled to manage the situation without further outside military assistance. Before the operation is terminated, it is important that all intelligence lessons learned are recorded in appropriate databases and are captured in joint doctrine. Likewise, the J-2 should

*JIPOE supports assessment by helping decide what measures of performance and effectiveness in the operational environment determine progress toward setting the conditions necessary to achieve an objective.*

ensure that all JIPOE products are appropriately archived.

Assessment is a continuous process that measures the overall effectiveness of employing joint force capabilities during military operations. Commanders continuously assess the operational environment and the progress of operations, and then compare them to their initial vision and intent. Assessment actions and measures help commanders adjust operations and resources as required, determine when to execute branches and sequels, and make other critical decisions to ensure current and future operations remain aligned with the mission and desired end state. Assessment occurs at all levels and across the entire range of military operations. The JIPOE process supports assessment by helping the commander and staff decide what aspects of the operational environment to measure and how to measure them to determine progress toward accomplishing tasks, and setting conditions necessary to achieve an objective.

The assessment process uses measures of performance to evaluate task performance at all levels of war, and measures of effectiveness (MOEs) to determine progress of operations toward achieving objectives. The assessment process and related measures should be relevant, measurable, responsive, and resourced so there is no false impression of accomplishment. JIPOE analysts help assess task accomplishment by supporting the battle damage assessment, munitions effectiveness assessment, and reattack recommendation. At the strategic and operational levels, JIPOE products provide much of the substantive baseline analysis and characterization of systems and functional capabilities required for target system analysis and task assessment. At the operational level, the JIPOE process supports target development by determining the anticipated times and locations where adversary targets are expected to appear. At the tactical level, JIPOE support may also include analysis of specific target composition and vulnerability.

JIPOE products, supplemented by the use of a red team to critically examine the MOE from the adversary's perspective, help ensure the JFC is measuring the

“important things.” The JIPOE process is particularly valuable in identifying and developing indicators (which are the foundation of MOEs) to monitor changes in adversary system behavior, capabilities, or the operational environment. These indicators help JFCs, their staffs, and component commanders determine if the joint force is “doing the right things” to achieve objectives, not just “doing things right.”

### Special Considerations

*Some types of missions, operations, and situations require a more tailored approach with greater emphasis on aspects of the operational environment.*

In its most basic sense, the JIPOE process simply combines an understanding of the constraints and influences imposed by the operational environment with the normal *modus operandi* of an adversary in order to forecast that adversary’s future actions. However, some types of missions, operations, and situations may require a more tailored JIPOE approach that places greater emphasis on specific aspects of the operational environment.

*JIPOE supports each special situation, operation, and mission with the differing mindsets, techniques, collaboration, focus, detail, accuracy, and emphasis necessary to their success.*

JIPOE support during operations that focus on the civil population as a COG requires a different mindset and different techniques than a JIPOE effort that focuses on defeating an adversary militarily.

JIPOE support during stability operations and irregular warfare (IW) requires a more detailed understanding of the relevant area’s sociocultural factors than is normally the case during traditional war.

Infrastructure analysis takes on added importance as the focus of military operations shifts from target development during traditional war to the reconstruction of facilities and reestablishment of services during stability operations. From an infrastructure perspective, it is imperative to understand the current state of the previous and remaining government services, associated civilian expertise, transportation nodes, lines of communications, hospital and medical facilities and public utilities as well as what is projected to remain. An accurate portrayal of the infrastructure status will potentially prevent or help eliminate humanitarian crises.

Human intelligence (HUMINT) and GEOINT assume increased importance in stability operations. In combination, HUMINT, GEOINT, and other sources enable the creation of products invaluable during stability operations and IW. Stability operations require extremely accurate geospatial products and information with significantly greater detail. HUMINT assumes increased importance during stability operations and IW and often provides the most valuable sources of information.

During stability operations and IW, the joint force will usually operate in a complex international environment alongside other important actors that will have a need for JIPOE products. Therefore, a robust information sharing process will be required with individuals operating at multiple classification levels. Support to stability operations will require JIPOE planners to collaborate closely with intelligence community elements to obtain expertise and materials that do not exist at the JTF level.

The primary difference between the basic JIPOE process during traditional war and the JIPOE effort during stability operations and IW is one of focus; particularly in the high degree of detail required, and the strong emphasis placed on demographic analysis of the civil population. JIPOE products must be tailored to the situation and focus on analyzing the vulnerabilities of critical infrastructure, understanding the motivations of the adversary, and identifying any shared aspirations, values, or outlooks that link the adversary to the general population.

Adversaries are likely to use asymmetric approaches as a method of degrading or negating support for military operations or the military dominance of friendly forces. The adversary may use asymmetric means to counter friendly ISR capabilities and complicate friendly targeting efforts through military deception, camouflage and concealment, frequent repositioning of mobile infrastructure, and the selective use of air defense systems to force airborne ISR assets to less than optimum flight profiles. JIPOE support to ISR is designed to optimize the employment of ISR and target



acquisition assets by forecasting the times and locations of anticipated adversary activity.

An adversary is likely to use information-related approaches to counter US advantages in C2, information processing, and decision making, and to reduce public and international support for military operations. JIPOE supports IO and activities by identifying adversary capabilities, vulnerabilities, and strategies and influencing friendly public opinion and decision making.

Adversaries may commit terrorist acts against US Service members, civilian employees, family members, facilities, and equipment in an attempt to demoralize US forces and counter public support for military operations. JIPOE helps combat terrorism by supporting force protection measures, counterintelligence, and other security related activities.

In order to counter US advantages in conventional forces, an adversary may support insurgencies in other countries or in response to an occupation of their country. Due to the high level of physical and political risk involved, special operations require extremely detailed JIPOE products.

The actual or threatened development, proliferation, or employment of WMD by an adversary can impact friendly forces by causing those forces to prepare for or conduct WMD nonproliferation, counterproliferation, or consequence management operations. JIPOE analysts help mitigate this threat by assessing the adversary's potential proliferation or employment of WMD, characterizing the consequences of a WMD related activity, and supporting the joint force's WMD defense effort.

An adversary may use theater ballistic missiles, unmanned aircraft, and cruise missiles to directly threaten friendly forces or to provoke political situations that may have strategic ramifications. Theater ballistic missile defense and counterair operations help protect the force from these types of asymmetric threats.

## **Conclusion**

This publication establishes joint doctrine for the conduct of JIPOE in relation to the levels of war and across the range of military operations.



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# CHAPTER I

## AN OVERVIEW OF JOINT INTELLIGENCE PREPARATION OF THE OPERATIONAL ENVIRONMENT

*“Nothing is more worthy of the attention of a good general than the endeavor to penetrate the designs of the enemy.”*

**Machiavelli  
Discourses, 1517**

### 1. Introduction

Joint intelligence preparation of the operational environment (JIPOE) is the analytical process used by joint intelligence organizations to produce intelligence assessments, estimates, and other intelligence products in support of the joint force commander’s (JFC’s) decision-making process. It is a continuous process that involves four major steps: (1) defining the total operational environment; (2) describing the impact of the operational environment; (3) evaluating the adversary; and (4) determining and describing adversary potential courses of action (COAs), particularly the adversary’s most likely COA and the COA most dangerous to friendly forces and mission accomplishment. The process is used to analyze the physical domains (air, land, maritime and space); the information environment (which includes cyberspace), political, military, economic, social, information, and infrastructure (PMESII) systems; and all other relevant aspects of the operational environment, and to determine an adversary’s capabilities to operate within that environment. JIPOE products are used by joint force, component, and supporting command staffs in preparing their estimates and are also applied during the analysis and selection of friendly COAs.

a. The JIPOE process assists JFCs and their staffs in achieving information superiority by identifying adversary centers of gravity (COGs), focusing intelligence collection at the right time and place, and analyzing the impact of the operational environment on military operations. However, JIPOE’s main focus is on providing predictive intelligence designed to help the JFC discern the adversary’s probable intent and most likely future COA. Simply stated, JIPOE helps the JFC to stay inside the adversary’s decision-making cycle in order to react faster and make better decisions than the adversary.

b. The intelligence directorates of a joint staff (J-2s) at all levels coordinate and supervise the JIPOE effort to support joint operation planning, enable commanders and other key personnel to visualize the full range of relevant aspects of the operational environment, identify adversary COGs, conduct assessment of friendly and enemy actions, and evaluate potential adversary and friendly COAs. The JIPOE effort must be fully coordinated, synchronized, and integrated with the separate intelligence preparation of the battlespace (IPB) efforts of the component commands and Service intelligence centers. Additionally, JIPOE relies heavily on inputs from several related, specialized efforts, such as geospatial intelligence preparation of the environment (GPE) and medical intelligence preparation of the operational environment (MIPOE). All staff elements of the joint force and component commands fully participate in the JIPOE effort by

providing information and data relative to their staff areas of expertise. However, JFCs and their subordinate commanders are the key players in planning and guiding the intelligence effort, and JIPOE plays a critical role in maximizing efficient intelligence operations, determining an acceptable COA, and developing a concept of operations (CONOPS). Therefore, commanders should integrate the JIPOE process and products into the joint force's planning, execution, and assessment efforts.

*Refer to Joint Publication (JP) 2-0, Joint Intelligence, and JP 2-01, Joint and National Intelligence Support to Military Operations, for specific procedures on requesting collection, exploitation, or production to support JIPOE. For further information regarding GPE and MIPOE refer to JP 2-03, Geospatial Intelligence Support to Joint Operations, and JP 4-02, Health Service Support.*

## 2. The Operational Environment – A Holistic View

The operational environment is the composite of the conditions, circumstances, and influences that affect the employment of capabilities and bear on the decisions of the commander. Understanding this environment requires a holistic view that extends beyond the adversary's military forces and other combat capabilities within the operational area. A holistic view of the operational environment encompasses physical areas and factors (of the air, land, maritime, and space domains) and the information environment (which includes cyberspace). Included within these are the adversary, friendly, and neutral PMESII systems and subsystems that are relevant to a specific joint operation. Understanding the operational environment is fundamental to identifying the conditions required to achieve stated objectives; avoiding the effects that may hinder mission accomplishment (undesired effects); and assessing the impact of friendly, adversary, and other actors, as well as the local populace, on the commander's CONOPS and progress toward attaining the military end state. Figure I-1 graphically conceptualizes a holistic view of the operational environment.

a. **Physical Areas and Factors.** The physical areas include the assigned operational area and the associated areas of influence and interest necessary for the conduct of operations within the air, land, maritime, and space domains. These domains include numerous factors the JFC and staff must consider such as terrain, topography, hydrology, meteorology, oceanography, and space, surface, and subsurface environmental conditions (natural or man-made); distances associated with the deployment and employment of forces and other joint capabilities; the location of bases, ports, and other supporting infrastructure; and friendly, adversary, neutral, and other combatant, or hostile, forces and capabilities. Combinations of these factors greatly affect the operational design and sustainment of joint operations.

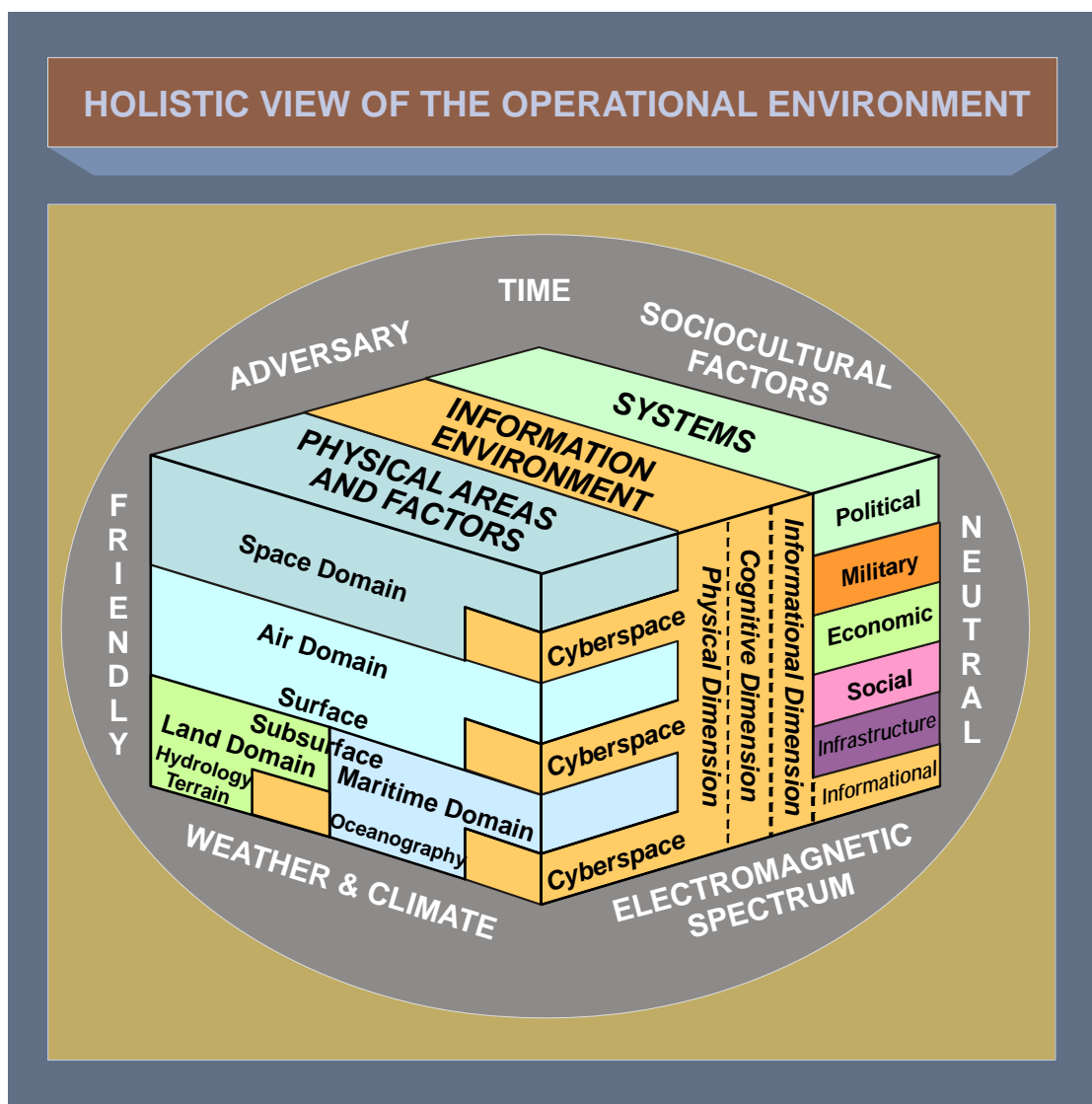


Figure I-1. Holistic View of the Operational Environment

b. **Information Environment.** The information environment is the aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information. It is made up of three interrelated dimensions: physical, informational, and cognitive. A significant aspect of the information environment is cyberspace, which overlaps the physical and informational dimensions of the information environment. It is critical that JIPOE analysis of the information environment include support to cyberspace operations and the identification of key individuals and groups having influence among the indigenous population as well as the source of their influence (e.g., social, financial, religious, political).

*For more information on the information environment, refer to JP 3-13, Information Operations.*

c. **Systems Perspective.** A systems perspective of the operational environment strives to provide an understanding of significant relationships within interrelated

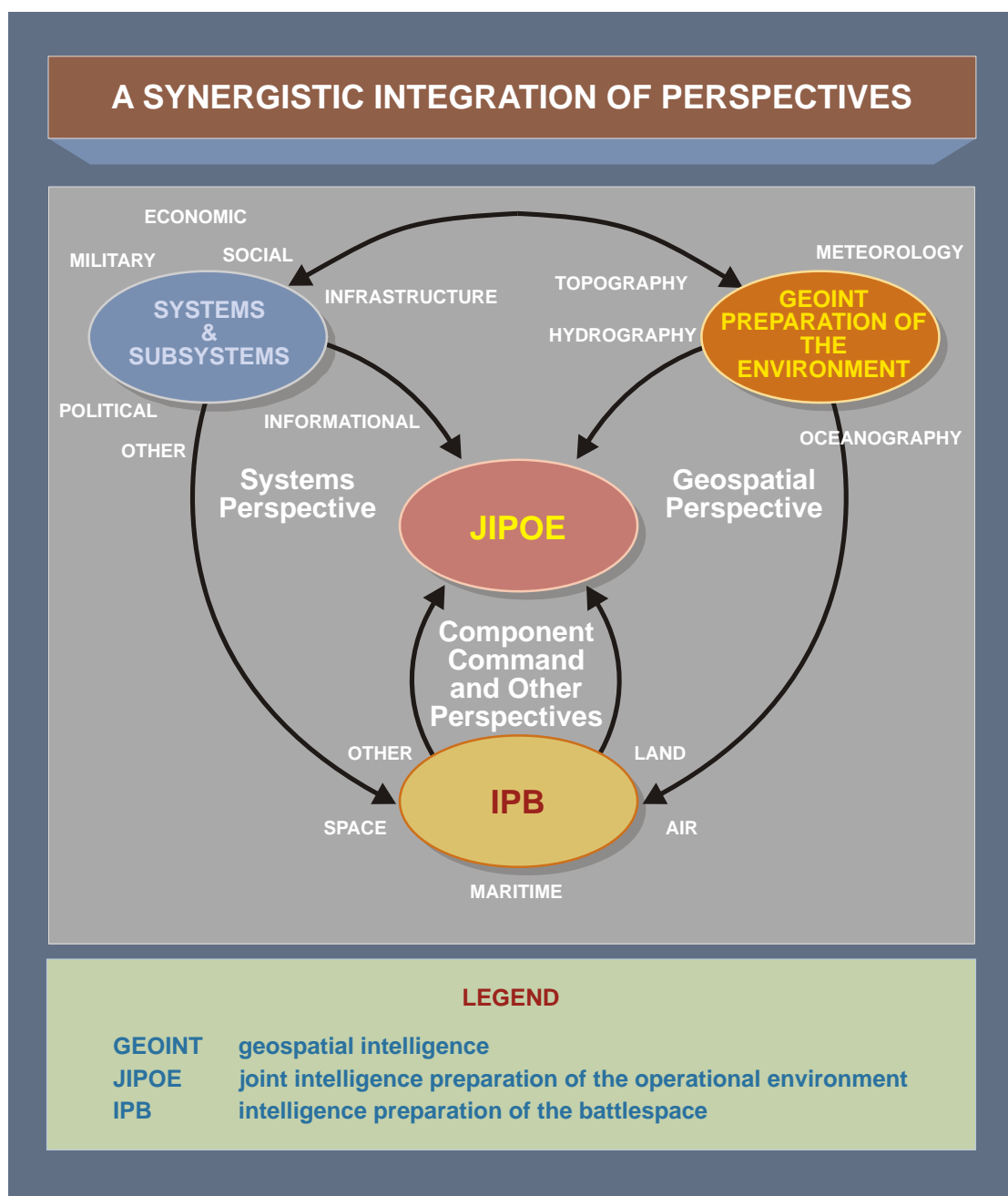
PMESII and other systems relevant to a specific joint operation, without regard to geographic boundaries, but which considers a focus area specified by the commander. This focus area usually will be based on an impending or potential contingency or on other factors of interest to the JFC. Among other benefits, this perspective helps intelligence analysts identify potential sources from which to gain indications and warning, and facilitates understanding the continuous and complex interaction of friendly, adversary, and neutral systems. Although this description of the operational environment is not, itself, an element of operational design, it supports most design elements. For example, this perspective helps analysts with COG analysis and planners with operational design by identifying nodes in each system, the links (relationships) between the nodes, critical factors, and potential decisive points. This understanding facilitates the identification and use of decisive points, lines of operations, and other design elements, and allows commanders and staffs to consider a broader set of options to focus limited resources, create desired effects, and achieve objectives. See Chapter II, “The Process for Joint Intelligence Preparation of the Operational Environment,” for more information on the development of a systems perspective as part of the JIPOE process.

d. **Other Factors.** Some factors exert direct or indirect influence throughout all aspects of the operational environment. These other factors help compose a holistic view of the operational environment and include weather and climate, sociocultural factors, and time as it relates to an adversary’s ability to decide and react. In some types of operations, such as foreign humanitarian assistance, counterinsurgency, and nation assistance, some of these factors reach critical importance.

### 3. Differences Between Joint Intelligence Preparation of the Operational Environment and Intelligence Preparation of the Battlespace

a. JIPOE and IPB products generally differ in terms of their relative purpose, focus, and level of detail. The purpose of JIPOE is to support the JFC by determining the adversary’s probable intent and most likely COA for countering the overall friendly joint mission, whereas IPB is specifically designed to support the individual operations of the component commands. During operational-level, force-on-force confrontations, JIPOE utilizes a macro-analytic approach that seeks to identify an adversary’s strategic vulnerabilities and COGs, whereas IPB generally requires microanalysis and a finer degree of detail in order to support component command operations. However, in some situations (especially during military engagement, security cooperation, and deterrence operations, or crisis response and limited contingency operations), both JIPOE and IPB will require the highest possible level of detail. JIPOE and IPB analyses are intended to support each other while avoiding a duplication of analytic effort.

b. The JIPOE process also emphasizes a *holistic* approach by analyzing and integrating a systems perspective and geospatial perspective with the force-specific IPB perspectives of the component commands, multinational partners, or other organizations. (See Figure I-2). This holistic approach creates an analytic synergy that helps JIPOE analysts assess the adversary’s diplomatic, informational, military, and economic options.



**Figure I-2. A Synergistic Integration of Perspectives**

The JIPOE process also provides a methodology for refining the assessment of the adversary's military option and for hypothesizing the adversary's most likely and most dangerous COAs. Once the JIPOE analyst has identified a likely military COA, the same analytic techniques can be used to identify the adversary's most likely CONOPS.

#### 4. Significance to the Joint Intelligence Process

JIPOE is a dynamic process that both supports, and is supported by, each of the categories of intelligence operations that comprise the intelligence process (see Figure I-3).



Figure I-3. The Intelligence Process

a. **JIPOE and Intelligence Planning and Direction.** The JIPOE process provides the basic data and assumptions regarding the adversary and other relevant aspects of the operational environment that help the JFC and staff identify intelligence requirements, information requirements, and collection requirements. By identifying known adversary capabilities, and applying those against the impact of the operational environment, JIPOE provides the conceptual basis for the JFC to visualize and understand how the adversary might threaten the command or interfere with mission accomplishment. This analysis forms the basis for developing the commander's priority intelligence requirements (PIRs), which seek to answer those questions the JFC considers vital to the accomplishment of the assigned mission. Additionally, by identifying specific adversary COAs and COGs, JIPOE provides the basis for wargaming in which the staff "fights" each friendly and adversary COA. This wargaming process identifies decisions the JFC

must make during execution and allows the J-2 to develop specific intelligence requirements to facilitate those decisions. JIPOE also identifies other critical information gaps regarding the adversary and other relevant aspects of the operational environment, which form the basis a collection strategy that synchronizes and prioritizes collection needs and utilization of resources within the phases of the operation.

*See JP 2-0, Joint Intelligence, for a more in-depth discussion of the relationship between intelligence requirements and information requirements. See JP 2-01, Joint and National Intelligence Support to Military Operations, for detailed guidance on the request for information (RFI) process.*

**b. JIPOE and Intelligence Collection.** JIPOE provides the foundation for the development of an optimal intelligence collection strategy by enabling analysts to identify the time, location, and type of anticipated adversary activity corresponding to each potential adversary COA. JIPOE products include several tools that facilitate the refinement of information requirements into specific collection requirements. JIPOE templates facilitate the analysis of all identified adversary COAs and identify named areas of interest (NAIs) where specified adversary activity, associated with each COA, may occur. JIPOE matrices are also produced that describe the indicators associated with each specified adversary activity. In addition to specifying the anticipated locations and type of adversary activity, JIPOE templates and matrices also forecast the times when such activity may occur, and can therefore facilitate the sequencing of intelligence collection requirements and the identification of the most effective methods of intelligence collection.

**c. JIPOE and Processing and Exploitation.** The JIPOE process provides a disciplined yet dynamic time phased methodology for optimizing the processing and exploiting of large amounts of data. The process enables JIPOE analysts to remain focused on the most critical aspects of the operational environment, especially the adversary. Incoming information and reports can be rapidly incorporated into existing JIPOE graphics, templates, and matrices. In this way, JIPOE products not only serve as excellent processing tools, but also provide a convenient medium for displaying the most up-to-date information, identifying critical information gaps, and supporting operational and campaign assessments.

**d. JIPOE and Analysis and Production.** JIPOE products provide the foundation for the J-2's intelligence estimate. In fact, the JIPOE process parallels the paragraph sequence of the intelligence estimate format (Figure I-4). Paragraph 2.a., "Characteristics of the Operational Area," is specifically derived from the second step of the JIPOE process, which describes the impact of the operational environment on friendly and adversary operations. The third step of the JIPOE process, an evaluation of the adversary, provides the data for the intelligence estimate's paragraphs 2.b, "Adversary Military Situation" and 3, "Adversary Capabilities". Likewise, the analysis of adversary COAs, prepared during the fourth JIPOE step, is used in paragraphs 4, "Analysis of Adversary Capabilities" and 5, "Conclusions" of the intelligence estimate.



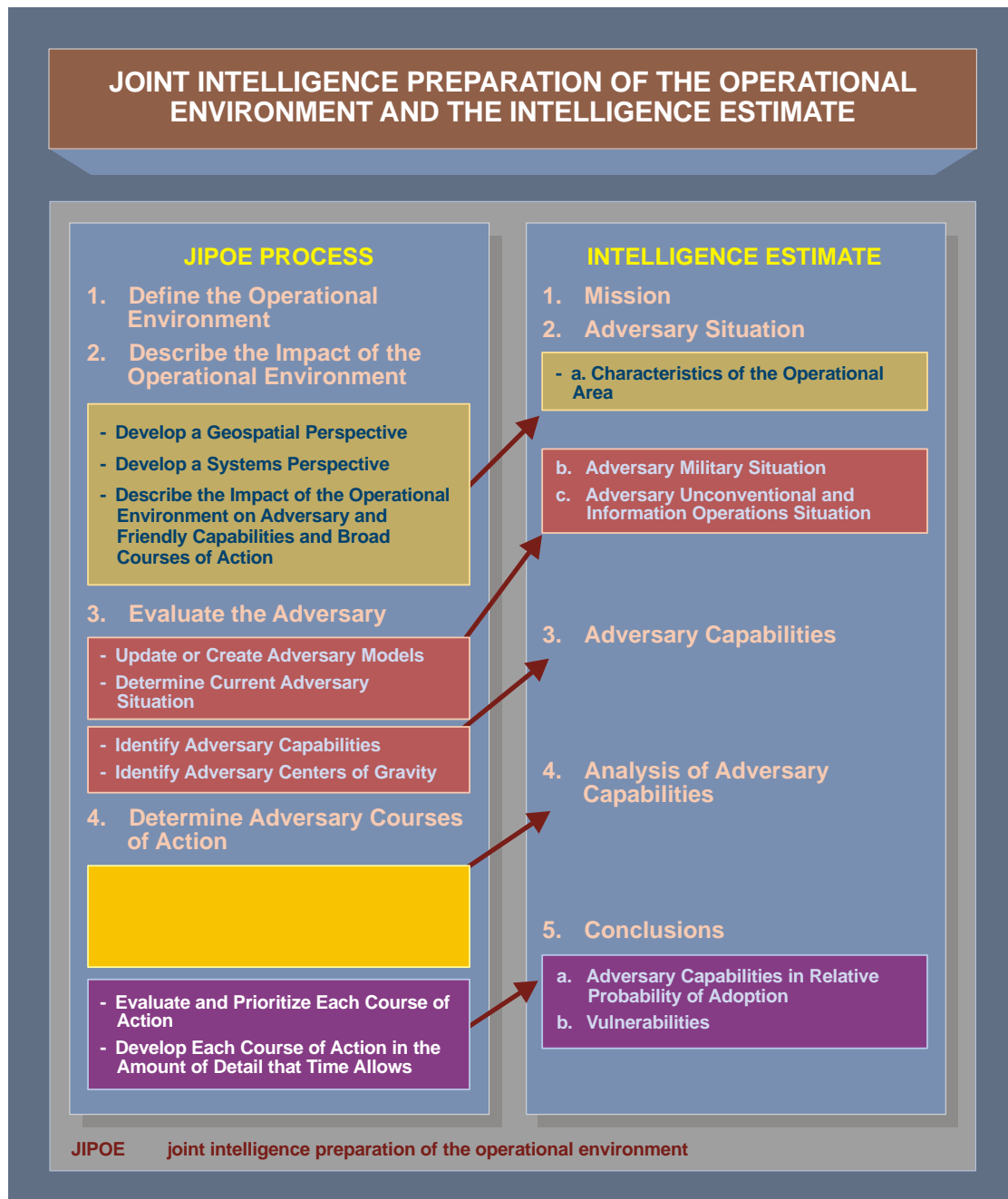


Figure I-4. Joint Intelligence Preparation of the Operational Environment and the Intelligence Estimate

e. **JIPOE and Dissemination and Integration.** The J-2's intelligence estimate provides vital information that is required by the joint force staff to complete their estimates, and for subordinate commanders to continue concurrent planning activities. Timely dissemination of the intelligence estimate is therefore paramount to good operation planning. If time does not permit the preparation and dissemination of a written intelligence estimate, JIPOE templates, matrices, graphics, and other data sources can and should be disseminated to other joint force staff sections and component and supporting commands in order to facilitate their effective integration into operation

planning. JIPOE geospatial perspectives should also be provided to systems supporting the common operational picture.

f. **JIPOE and Evaluation and Feedback.** Consistent with the intelligence process, the J-2 staff continuously evaluates JIPOE products to ensure that they achieve and maintain the highest possible standards of intelligence excellence as discussed in JP 2-0, *Joint Intelligence*. These standards require that intelligence products anticipate the needs of the JFC and are timely, accurate, usable, complete, objective, and relevant. If JIPOE products fail to meet these standards, the J-2 should take immediate remedial action. The failure of the J-2 staff to achieve and maintain intelligence product excellence may contribute to the joint force's failing to accomplish its mission.

## 5. Organizations, Roles, and Responsibilities

a. **Services.** The Services are responsible for training Service intelligence, meteorological and oceanographic (METOC), and geospatial information and services (GI&S) personnel in JIPOE and IPB techniques, equipping their forces with the materiel needed to conduct IPB during tactical operations, and for the production and dissemination of IPB products derived from specific databases located at the Service intelligence centers.

b. **The Defense Intelligence Agency (DIA) Defense Intelligence Operations Coordination Center (DIOCC).** The DIA DIOCC is the focal point for tasking the production of baseline strategic intelligence analysis in support of current and planned joint operations in accordance with established Defense Intelligence Analysis Program (DIAP) procedures. DIA manages the DIAP and provides direction and deconfliction for JIPOE intelligence production support by Service intelligence centers. During a crisis, the DIOCC is also responsible for facilitating a combatant commander's (CCDR's) request for federated intelligence support. The DIOCC receives and validates all RFIs submitted by the combatant commands and tasks national-level organizations for collection or production in response to intelligence requirements. Additionally, DIA initiates and produces all-source, finished intelligence production in support of JFC JIPOE processes consistent with its DIAP responsibilities.

*For more detailed guidance, see JP 2-01, Joint and National Intelligence Support to Military Operations.*

c. **Combatant Commander.** The CCDR is responsible for ensuring the standardization of JIPOE products within the command and subordinate joint forces, and for establishing theater procedures for collection management and the production and dissemination of intelligence products. The CCDR is also responsible for identifying requirements for federated intelligence support to the DIOCC, which will facilitate the establishment of a federated intelligence support architecture.

d. **J-2.** The J-2 has the primary staff responsibility for planning, coordinating, and conducting the overall JIPOE analysis and production effort at the joint force level.

Through the JIPOE process, the J-2 enhances the JFC's and other staff elements' ability to visualize all relevant aspects of the operational environment. The J-2 uses the JIPOE process to formulate and recommend PIRs for the JFC's approval, and develops information requirements that focus the intelligence effort (collection, processing, production, and dissemination) on questions crucial to joint force planning. To enhance the joint force's common operational picture, the J-2 should integrate component and supporting command IPB products with the joint force's JIPOE products in order to form a more complete and detailed picture of an adversary's capabilities, vulnerabilities, and potential COAs and promulgating these updated products as required. The J-2 staff should accomplish this in concert with the component command intelligence staffs, either directly or via any available secure electronic means that allows visualization of the JIPOE product, such as the Joint Worldwide Intelligence Communications System (JWICS) or the SECRET Internet Protocol Router Network (SIPRNET). The J-2 is also responsible for incorporating the available intelligence capabilities of supporting national agencies and joint commands into the JIPOE process, particularly in the areas of GI&S, METOC, sociocultural factors, and strategic targeting. Additionally, the J-2 disseminates JIPOE products in time to support planning by other joint force staff sections and component command staffs, and ensures such products are continuously updated. Due to lack of information, it may be necessary for the J-2 to formulate and propose to the JFC assumptions regarding adversary capabilities. In such cases, the J-2 should ensure that all assumptions are clearly understood by the JFC and the joint force staff to be only assumptions, while at the same time striving to collect the requisite intelligence needed to confirm or deny those assumptions. Most importantly, the J-2 should ensure that possible adversary COAs are not dismissed as "impossible" simply because of their relative degree of difficulty. On the other hand, if a combination of limiting factors associated with operational environment characteristics and adversary capabilities truly make a COA physically impossible to accomplish, then the J-2 must identify it as such.

e. **Combatant Command Joint Intelligence Operations Center (JIOC).** The JIOC is the focal point for the overall JIPOE analysis and production effort within the combatant command. It is responsible for managing collection requirements related to JIPOE and IPB efforts, and for producing intelligence products for the CCDR and subordinate commanders that support joint operation planning and ongoing operations. The JIOC ensures that the JIPOE production effort is accomplished in conjunction with all appropriate combatant command staff elements, particularly the geospatial intelligence (GEOINT), METOC, and information operations (IO) staff officers. The JIOC also ensures that its JIPOE analysis is fully integrated with all IPB and JIPOE products produced by subordinate commands and other organizations. With the assistance of all appropriate joint force staff elements, the JIOC identifies information gaps in existing intelligence databases and formulates collection requirements and RFIs to address these shortfalls. Additionally, the combatant command JIOC may be requested to support another CCDR's federated intelligence requirements, to include JIPOE requirements. As a federated partner, the JIOC must be prepared to integrate into the overall federated intelligence architecture identified by the supported CCDR. All combatant command JIOCs are eligible to participate in federated intelligence support operations.

f. **Subordinate Joint Force Commander.** The subordinate JFCs clearly state their objectives, CONOPS, and operation planning guidance to their staffs and ensure that the staff fully understands their intent. Based on wargaming and the joint force staff's recommendation, the JFC selects a friendly COA and issues implementing orders. The JFC also approves the list of intelligence requirements associated with that COA. The JFC then identifies those intelligence requirements most critical to the completion of the joint force's mission as PIRs.

g. **Joint Task Force (JTF) Joint Intelligence Support Element (JISE) or JIOC.** The intelligence organization at the JTF level is normally a JISE. However, the limited resources of a JISE will usually preclude a full JIPOE effort at the JTF level without substantial augmentation, reliance on reachback capability, and national-level assistance. To overcome this limitation, the CDR may authorize the establishment of a JTF-level JIOC based on the scope, duration, and mission of the unit or JTF. A JTF JIOC is normally larger than a JISE and is responsible for complete air, space, ground, and maritime order of battle (OB) analysis; identification of adversary COGs; analysis of command and control (C2) and communications systems, targeting support; collection management; and maintenance of a 24-hour watch. Additionally, the JTF JIOC (if formed) serves as the focal point for planning, coordinating, and conducting JIPOE analysis and production at the subordinate joint force level. Most important, DIOCC forward element (DFE) personnel and liaison officers from Department of Defense (DOD) intelligence organizations provide the JTF JIOC with the means to obtain national support for the JIPOE effort. The JTF JIOC conducts its JIPOE analysis in conjunction with all other appropriate joint force and component command staff elements, particularly the GI&S and METOC staff officers.

h. **Joint Geospatial Intelligence Cell.** The JFC can designate a GEOINT officer and a GEOINT cell to manage the framework for accessing authoritative GEOINT data to enhance the joint force's common operational picture for situational awareness and decision making. GEOINT support includes imagery, imagery intelligence, and geospatial information across all functions and activities within the organization.

*For more detailed guidance, see JP 2-03, Geospatial Intelligence Support to Joint Operations.*

i. **Subordinate Component Commands.** The intelligence staffs of the subordinate component commands should ensure that appropriate IPB products are prepared for each domain in which the component command operates. Subordinate component commands should evaluate the specific factors in the operational environment that will affect friendly, neutral, and adversary COAs in and around their operational area and impact perceptions and support within their area of interest (AOI). More importantly, the analysis of the operational environment should better define those who are potentially friendly, potentially neutral, and potentially adversarial and the actions which would determine their orientation. These component command IPB products provide a level of detail and expertise that the J-2 should not attempt to duplicate, but must draw upon in order to form an integrated or "total" picture of an adversary's joint capabilities and

probable COAs. Accordingly, the component commands should coordinate their IPB effort with the J-2 and with other component commands that have overlapping IPB responsibilities. This will ensure their IPB products are coordinated and disseminated in time to support the joint force's JIPOE effort.

j. **JIPOE Coordination Cell.** The JFC may organize a "JIPOE coordination cell" (or similarly-named entity) to assist in integrating and synchronizing the JIPOE effort with various supporting organizations, related capabilities, and appropriate staff functions. The organizational relationships between the JIPOE coordination cell and the organizations that support the cell should be per JFC guidance. Normally, a J-2 representative will chair the JIPOE coordination cell. Organizations participating in the cell provide advice and assistance regarding the employment of their respective capabilities and activities. Figure I-5 is intended as a guide in determining possible cell participants that could help coordinate the JIPOE effort, provide input, or assist in obtaining external support. The JFC should tailor the composition of the cell as necessary to accomplish the mission. Organizational and functional representation in the JIPOE coordination cell may include, but is not limited to, the following personnel:

(1) **J-2 Representative.** Exercises primary staff oversight of the JIPOE effort and normally chairs the JIPOE coordination cell. Also acts as the subject matter expert for intelligence oversight issues.

(2) **The Operations Directorate of a Joint Staff (J-3) and/or the Plans Directorate of a Joint Staff (J-5) Representative.** The J-3 and/or J-5 ensure that all participants in the JIPOE effort are continuously updated on planning for both current and follow-on missions as well as on any anticipated change to the operational area. The J-3 and/or J-5 representative consolidates information on our own dispositions and provides the cell a clear understanding of friendly COGs, capabilities, and vulnerabilities. The J-3 and/or J-5 will conduct wargames that test friendly COAs against the complete set of adversary COAs developed during the JIPOE process. Based on the results of these wargames, the J-3 and/or J-5 will refine and determine the probability of success of each friendly COA against each adversary COA identified during the JIPOE process, and will make a recommendation to the JFC regarding which friendly COA best accomplishes the joint mission within the JFC's guidance and intent.

(3) **The Communications System Directorate of a Joint Staff (J-6) Representative.** The J-6 representative ensures the JIPOE cell has a clear understanding of our own communications capabilities, critical assets/nodes, and critical vulnerabilities. The J-6 representative and staff assists in analyzing the impact of potential adversary COAs and relevant aspects of the information environment and electromagnetic spectrum on military operations.

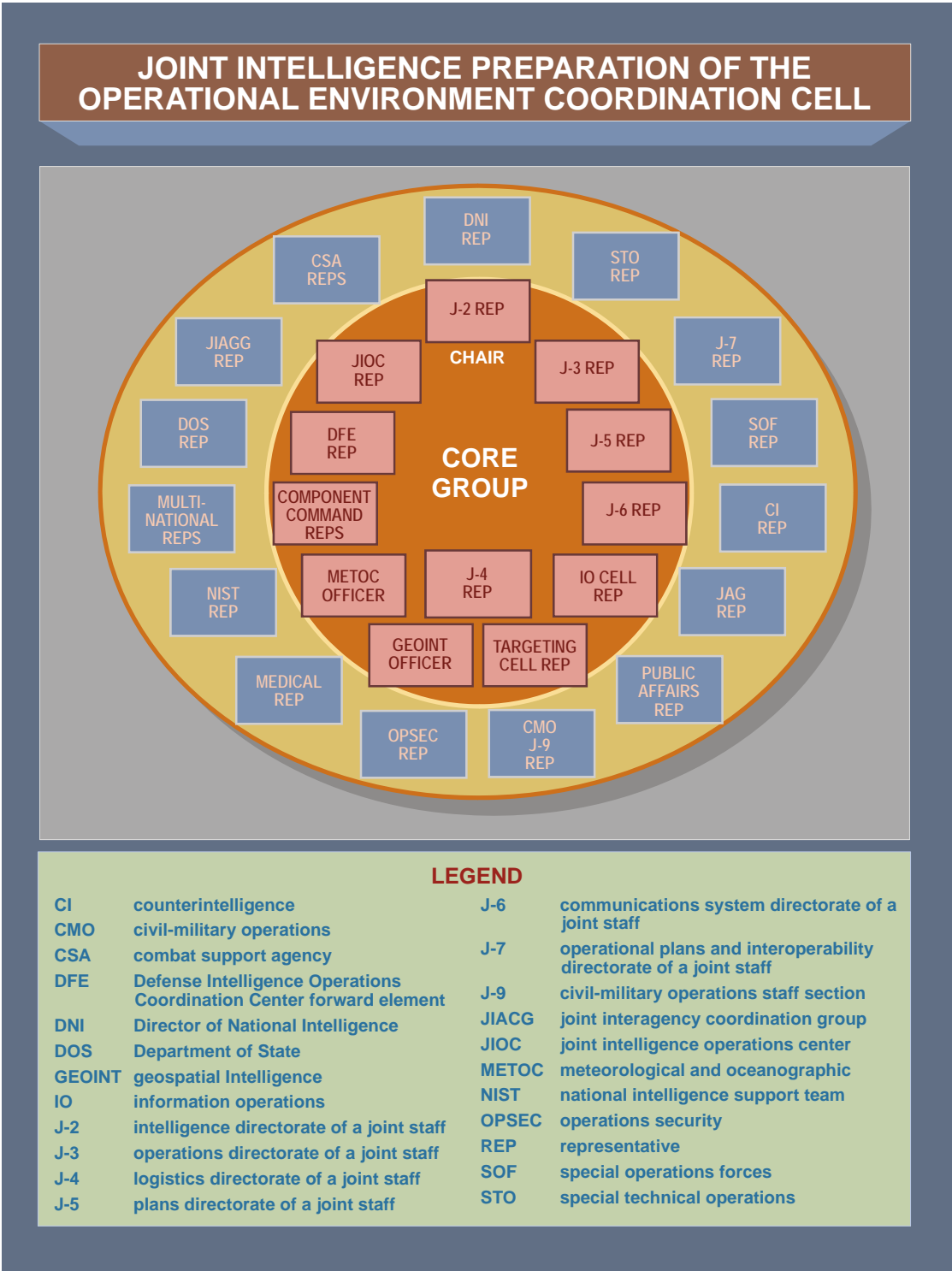


Figure I-5. Joint Intelligence Preparation of the Operational Environment Coordination Cell

(4) **Information Operations Cell Representative.** Provides advice and assistance in evaluating the information environment. IO personnel analyze adversary IO capabilities, decision making, and help determine adversary COAs. Additionally, the IO



Cell representative serves as a liaison with the IO cell and helps establish JIPOE requirements related to the integrated employment of the IO core capabilities of computer network operations (CNO), electronic warfare (EW), military deception (MILDEC), operations security (OPSEC), and psychological operations (PSYOP).

(5) **Targeting Cell Representative.** Serves as liaison with the joint force's targeting cell and coordinates JIPOE-derived targets with the joint targeting coordination board, if designated.

(6) **Geospatial Intelligence Officer.** Manages the GEOINT cell to ensure all information fusion, visualization, and analysis are geospatially enabled. Provides advice and assistance regarding geospatial issues including registering data to a common reference system. Assists JIPOE analysts with map backgrounds and data overlays.

(7) **METOC Staff Officer.** Advises the cell regarding the impact of weather and climate on the operational environment.

(8) **Service and Functional Component Representatives.** These officers provide liaison between the joint force and the component commands, and can help coordinate the JIPOE effort with the related IPB efforts of the components.

(9) **DFE Representative.** Facilitates and coordinates national-level support for the JIPOE effort from DOD intelligence community (IC) members.

(10) **JIOC Representative.** Updates the cell regarding the status of JIPOE requirements, production, and planning. Chairs the JIPOE coordination cell in the absence of the J-2 representative.

(11) **The Logistics Directorate of a Joint Staff (J-4) Representative.** The J-4 staff assists the JIPOE effort by analyzing specific factors that may affect both friendly and adversary sustainment capabilities, reinforcement, and intertheater and intratheater lines of communications (LOCs).

(12) **Public Affairs Representative.** Evaluates the impact of potential operational actions on the operational environment, assesses adversarial propaganda capabilities and potential actions and advises the JFC how best to counter them. Synchronizes public information activities with operations and articulates US military capabilities and United States Government (USG) actions and policy so audiences may develop informed perceptions of operations.

(13) **Special Technical Operations (STO) Representative.** Provides information critical to defining the operational environment (JIPOE step one) and describes the impact of the operational environment on joint operations (JIPOE step two). Helps focus the JIPOE effort on understanding STO-related requirements and ensures JIPOE products are fully integrated and coordinated in STO planning. STO read-ins are

conducted for appropriate JIPOE analysts based on mission requirements and governing security directives.

(14) **The Operational Plans and Interoperability Directorate of a Joint Staff (J-7) Representative.** Provides advice and assistance regarding JIPOE-related exercise planning, modeling and simulation, and ensures lessons learned are incorporated into the Joint Lessons Learned Program, as appropriate. (The J-7 is not typically a JTF-level staff directorate.)

(15) **Special Operations Forces (SOF) Representative.** Coordinates SOF-related JIPOE requirements and provides input to the JIPOE effort derived from SOF activities and sources.

(16) **J-2X (joint force counterintelligence and human intelligence staff element) Representative.** Coordinates JIPOE inputs to counterintelligence (CI) and human intelligence (HUMINT) activities which have significant roles in JIPOE. Provides input on adversary and neutral intelligence collection capabilities for OPSEC planning.

(17) **Judge Advocate/Legal Staff Representative.** Advises JIPOE planners regarding factors relevant to domestic and international law, such as status of forces agreements, rules of engagement (ROE) and rules for the use of force (RUF), legality of claimed territorial limits, exclusion zones, and other legal restrictions on military operations.

(18) **Civil-Military Operations (CMO) Staff Section (J-9) and/or Civil Affairs (CA) Representative.** Provides expert advice and assistance to the JIPOE coordination cell regarding civil considerations by evaluating the areas, structures, capabilities, organizations, people, and events of the operational environment. Also provides advice on rule of law, economic stability, governance, public health and welfare, infrastructure, and public education and information. The CMO and/or CA representative may also assist in obtaining support for the JIPOE effort from the host nation (HN), intergovernmental organizations (IGOs), nongovernmental organizations (NGOs), and the private sector.

(19) **Operations Security Representative.** Coordinates the joint force's OPSEC effort with the JIPOE effort. Uses JIPOE products to help identify existing threats and determine vulnerabilities of friendly forces, develops the critical information list, and implements OPSEC countermeasures.

(20) **Medical Representative.** Advises and assists the JIPOE effort regarding medical factors that may influence the operational environment (e.g., potential disease epidemics and vectors, existing health infrastructure, and environmental health risk factors).



(21) **National Intelligence Support Team Representative.** A deployable team that provides interface with national-level intelligence organizations and serves as a conduit for the transmittal of time-sensitive RFIs to the DIOCC for appropriate action.

(22) **Multinational Representatives.** Provide advice regarding their respective national intelligence capabilities and assist in obtaining support for the JIPOE effort.

(23) **Department of State (DOS) Representative.** The DOS representative to the joint force can coordinate DOS support to the JIPOE effort, particularly regarding political intelligence, diplomacy, and cultural factors.

(24) **Joint Interagency Coordination Group (JIACG) Representative.** Helps facilitate assistance for the JIPOE effort from USG agencies outside the national IC.

(25) **Combat Support Agency (CSA) Liaison Officers.** Facilitate national-level support for the JIPOE effort from their respective organizations.

(26) **Director of National Intelligence (DNI) Representative.** Facilitates and coordinates assistance for the JIPOE effort from members of the national IC.

## 6. Interagency and Multinational Considerations

Due to the breadth of required subject matter expertise, a comprehensive JIPOE effort based on a holistic view of the operational environment will normally require expertise beyond the capabilities of the joint force JIOC and subordinate components. The JIOC must therefore proactively seek out and exploit all possible assistance from interagency and multinational sources.

a. In particular, the development of a systems perspective will usually require assistance from, or collaboration with, national-level subject matter experts, both within and outside DOD. In this regard, the JIACG, joint force's DNI representative, CSA liaison officers, and DFE provide mechanisms for obtaining other government agency (OGA) support for the JIPOE effort.

b. Whenever possible within security guidelines, the JIPOE effort should include participation by the HN, allies, and coalition partners. Multinational partners may possess robust intelligence resources, or at least niche capabilities, that may provide invaluable insight regarding particular aspects of the operational environment. Many of these countries may have extensive regional expertise based on past history (e.g., colonial or trade relationships, past military occupation).

c. A multinational JIPOE effort requires interoperable GEOINT data, applications, and data exchange capabilities. Whenever possible, participants should agree to work on a standard datum and ensure that all JIPOE products utilize that datum. A multinational

GEOINT plan must coordinate all products for use by member forces, including access approval procedures and blending assets into a cohesive production program.

*For further information regarding GEOINT support, see JP 2-03, Geospatial Intelligence Support to Joint Operations.*

d. When conducting a multinational JIPOE effort it is important to consider the ramifications of labeling information about the operational environment as intelligence, especially when interacting with nonmilitary organizations. In many cultures, the perception of intelligence connotes information gathered on a nation's citizenry for exploitative or coercive purposes. Furthermore, attempts to exchange information with many NGOs and IGOs may prove difficult. Most NGOs and IGOs are eager to maintain political neutrality throughout the world and are unlikely to associate with US military organizations or participate in any overt or perceived *intelligence* gathering attempts. Nevertheless, *information* exchange throughout the operational area for the purpose of fostering mutual interests in resolving or deterring conflict or providing support is highly beneficial to all concerned parties. Information exchange should comply with limits based on terms of reference provided by the United States Institute for Peace/United Nations (UN) Office for Coordinating Humanitarian Assistance.

## **7. Joint Intelligence Preparation of the Operational Environment Relationship to the Levels of War**

The basic JIPOE process remains the same across the range of military operations, regardless of the level of war. Nevertheless, specific JIPOE planning considerations may vary considerably between strategic, operational, and tactical levels due to obvious differences in mission, available resources, and size of the operational areas and AOIs. Strategic-level JIPOE must examine the instruments of national power: diplomatic, informational, military, and economic. JIPOE support to the operational level is concerned with analyzing the operational area, facilitating the flow of friendly forces in a timely manner, sustaining those forces, and then integrating tactical capabilities at the decisive time and place. JIPOE support to tactical operations generally requires a greater level of detail over a smaller segment of the operational environment than is required at the strategic and operational levels. However, under certain circumstances tactical operations can assume strategic importance and may constitute a critical part of joint operations, as during some types of crisis response and limited contingency operations or military engagement, security cooperation, and deterrence operations.

a. **Strategic-Level Considerations.** Activities at the strategic level establish national and multinational military objectives; develop global plans or theater war plans to achieve these objectives; sequence operations; define limits and assess risks for the use of military and other instruments of national security policy; and provide military forces and other capabilities in accordance with strategic plans. The strategic-level operational environment may encompass some aspects of the entire world due to global factors such as international law; the capability of adversary propaganda to influence world opinion and degrade US public support; adversary and friendly coalition structures; and the

capability and availability of national and commercial space-based systems and information technology. The strategic-level operational environment is analyzed in terms of geographic regions, nations, and climate rather than local geography and weather. Nonmilitary aspects of the operational environment assume increased importance at the strategic level. For example, the industrial and technological capabilities of a nation or region will influence the type of military force it fields. Similar factors may influence the ability of a nation to endure a protracted conflict without outside assistance. In some situations, political, economic, social, and information considerations may play a greater role than military factors in influencing adversary COAs. At this level, the analysis of the adversary's strategic capabilities will concentrate on considerations such as civil-military relations, national will and morale, ability of the economy to sustain warfare, mobilization of the strategic reserve, and possible intervention by third-party countries. COA models at the strategic level consider the entire range of resources available to the adversary. COA models identify both military and nonmilitary methods of power projection and influence, specify the theaters of main effort and the forces committed to each, and depict national as well as strategic- and theater-level objectives.

**b. Operational-Level Considerations.** At the operational level, the analysis of the operational environment depends on such varied factors as the location of adversary political and economic support structures, military support units, force generation capabilities, potential third-nation or third-party involvement, logistic and economic infrastructure, political treaties, press coverage, adversary propaganda, and the potential for IO. The size and scope of the analysis may also vary depending on particular aspects of the operational environment being considered. For example, if a landlocked adversary has the capability to conduct space-based intelligence collection or computer network attacks (CNAs), then the relevant portions of the space domain and the information environment would extend worldwide, while the maritime domain might be minimal. At the operational level, the JIPOE analysis should be tailored to the relevant characteristics in the JTF's operational environment. While most joint operations may encompass considerations and characteristics associated with many or all PMESII systems, the staff's focus and the balance of these considerations will vary according to the nature and phase of the operation.

(1) In major operations involving large-scale combat (particularly in early phases), the staff will typically focus on military and infrastructure systems. Relevant characteristics may include:

(a) the capability of road, rail, air, and sea transportation networks to support the movement of, and logistic support to, large military units, to include seasonal climatic impact;

(b) zones of entry into and through the operational area and AOI;

(c) the impact of large geographic features such as mountains, large forests, deserts, and archipelagos on military operations;

(d) the adversary's doctrine for C2, logistic support, release and use of weapons of mass destruction (WMD), theater ballistic missile forces, special operations, paramilitary forces; and

(e) adversary COAs described in terms of operational objectives, large-scale movements, LOCs, and the phasing of operations.

(2) In operations characteristic of stability operations and irregular warfare (IW), such as counterinsurgency and combating terrorism, the focus is on controlling, influencing and/or supporting the relevant population through political, economic, and psychological methods. Even when IW requires combat, additional characteristics from social, economic, diplomatic, and informational systems become relevant. Among many characteristics, these may include:

(a) an assessment of a society's ethnic breakdown and its relationship to the dislocated civilian (DC) problem, religious affiliations, historic grievances and conflict, loyalty to formal and informal leaders, points and dates of cultural significance, and language;

(b) an analysis of the relationship between the populace and the government that is designed to identify ways to gain the population's support for the government and reduce support for the insurgents;

(c) an analysis of the culture of the society as a whole and of each major group within the society; and,

(d) a determination of how formal and informal power is apportioned and used within a society.

**c. Tactical-Level Considerations.** At the tactical level, the analysis of the operational environment is focused on adversary land, air, maritime, space, and other forces as well as other relevant aspects of the operational environment that could pose a direct threat to the security of the friendly force or the success of its mission. The extent to which the operational environment is analyzed at the tactical level is largely dependent on the mission and planning time available. At a minimum, tactical-level forces should analyze the operational environment in terms of: military objectives; air, land, and maritime avenues of approach; and the impact of METOC and geographic conditions on personnel, military operations, weapons systems, and force mobility. The tactical-level evaluation of a military adversary should concentrate on standard OB factors, such as the composition, disposition, strength, tactics, techniques, and procedures (TTP), and training status of specific tactical units or factional groups that could interfere with mission accomplishment. JIPOE and IPB should emphasize a holistic approach, analyzing both military and nonmilitary aspects of the operational environment. JIPOE should also account for the relevant conditions in the operational environment that enable or restrict the actions of friendly, neutral, and hostile populations. At the tactical level, sociocultural dynamics that highlight how people achieve security, acquire/exchange

basic resources, and exchange information are critical to mission success, especially in phase four of a conventional fight or in all phases of IW and humanitarian operations. The development, analysis, and description of adversary COAs at the tactical level will be based on and result in a higher degree of detail than would be necessary at higher levels of military operations.

*“Intel is traditionally order of battle-oriented. It doesn’t fit here. There is no organized adversary, which may actually be starvation, anarchy and crime. The planning process is much different. We need a broader-based approach; much more flexible. A plus B does not always equal C.”*

**General Anthony Zinni, US Marine Corps (Ret)**  
**1994**

### 8. Considerations Across the Range of Military Operations

a. Joint forces conduct JIPOE to develop a holistic view of the operational environment and assess adversary potential COAs in a wide variety of situations across the range of military operations. Within the context of JIPOE, the JFC and J-2 must apply the term “adversary” broadly, to refer to those organizations, groups, decision makers, or even physical factors that can delay, degrade, or prevent the joint force from accomplishing its mission. For example, during some **crisis response and limited contingency operations**, such as homeland defense, disaster relief, and civil support, the JIPOE “adversary” may actually be a condition or situation, such as a hurricane with its related flooding, the outbreak of a disease pandemic with its associated vectors, or the starvation faced by famine-struck refugees. During **military engagement, security cooperation, and deterrence operations**, the “adversary” may range from smugglers and drug cartels to insurgents and terrorists. Identifying and conducting a JIPOE analysis of these types of nontraditional “adversaries” presents a far greater challenge than the analysis of the more conventional “force-on-force” adversary normally associated with **major operations and campaigns**. It is imperative, therefore, that JFCs be aware of the policy and legal ramifications of operating in nontraditional operations, as they often affect, and sometimes restrict, mission execution.

b. Since potential adversaries have access to US doctrine, they will probably attempt to exploit the JIPOE process, either through deception or by deliberately adopting a COA different than the one the JIPOE analyst might normally identify as “most likely.” The JIPOE analyst needs to be aware of the relative importance a specific adversary may place on the principle of surprise. The JIPOE analyst should analyze the probability that the adversary may engage in deception by deliberately avoiding the most operationally efficient (and therefore most obvious) COA in order to achieve surprise. To accomplish the deception, the adversary will most likely deliberately provide or highlight expected “indicators” or information to reinforce what our intelligence analysts and forces expect for the “most likely” adversary COA. Additionally, an adversary may deceive the JIPOE analyst regarding the timing of an otherwise “obvious” COA, through asynchronous attack preparations and by psychologically conditioning the JIPOE analyst to accept unusual levels and types of activity as normal. For example, an adversary may choose to

prepare for an attack over a deliberately extended period of time. In this case the JIPOE analyst may be able to correctly identify the adversary's intent and most likely COA (i.e., attack), but will find it more difficult to estimate the actual time of the attack. Analysts may also use a "reverse JIPOE" process to assess their own forces from their opponent's perspective and thereby "reconstruct" their opponent's probable JIPOE assessment. This type of red team approach will help yield insight into an opponent's probable intelligence, surveillance, and reconnaissance (ISR) collection strategy and thereby assist planners in determining the best times and locations to plant deceptive information designed to mislead the opposing JIPOE analyst.

c. JIPOE is not a panacea for faulty strategic guidance or poor operation planning. JFCs and their staffs must understand that JIPOE is a useful methodology for analyzing the impact of the operational environment and adversary patterns of operation, and for formulating a hypothesis regarding the adversary's *possible* adoption of various COAs (i.e., what the enemy *may* do). It therefore provides a starting point for planning the intelligence collection effort and for formulating and wargaming friendly COAs. JIPOE should *not* be considered a "crystal ball" for determining with absolute certainty the adversary's *actual* intentions (i.e., what the enemy *will* do). JFCs and their staffs must understand that the JIPOE analyst *estimates* the most likely adversary COA based largely on factors and conditions in the operational environment that may change, and on assumptions about the adversary that may later prove invalid. Operation planning based solely on countering the most likely COA will leave the joint force vulnerable to other less likely COAs that the adversary may choose to adopt in order to maximize surprise.

**AN EXAMPLE OF "DECEPTION AND JOINT INTELLIGENCE  
PREPARATION OF THE OPERATIONAL ENVIRONMENT"**

**"The commander must always meticulously think out how to mislead the enemy in regard to the true intentions of the troops. In order to achieve surprise [the commander] may consciously work out some problems of the battle plan in a way different from the obvious solutions demanded by the situation.**

**An example of skillful selection of the direction of the main strike can be found in the actions of the 65th Army in the Belorussian offensive operation. It was decided that the main attack should be made through a certain piece of marshy terrain because the enemy believed that this area was inaccessible to advancing troops and therefore few forces [were allowed] for its protection. Making use of the surprise factor, Soviet troops managed to quickly cross the marsh and attain the enemy's flank, which promoted the overall success of the offensive."**

**SOURCE: V.G. Reznichenko, ed., *Taktika*, Voenizdat Press, 1987**

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## CHAPTER II

### THE PROCESS FOR JOINT INTELLIGENCE PREPARATION OF THE OPERATIONAL ENVIRONMENT

*"Know the enemy, know yourself -- your victory will never be endangered.  
Know the ground, know the weather -- your victory will then be total."*

Sun Tzu  
*The Art of War, C. 500 B.C.*

#### 1. Introduction

The JIPOE process provides a disciplined methodology for applying a holistic view of the operational environment to the analysis of adversary capabilities and intentions. This process consists of four basic steps that ensure the systematic analysis of *all* relevant aspects of the operational environment. The process is both continuous and cyclical in that JIPOE is conducted both prior to and during a joint operation as well as during planning for follow-on missions. The most current information available regarding the adversary situation and the operational environment is continuously integrated throughout the JIPOE process. Although some aspects of the JIPOE process may require adjustment depending on the type of mission, the basic process remains the same throughout the range of military operations. Figure II-1 graphically depicts the basic JIPOE process. Appendix A, "The Leyte Campaign – A Case Study of Support to Major Operations and Campaigns," illustrates the basic JIPOE process in a historical context.

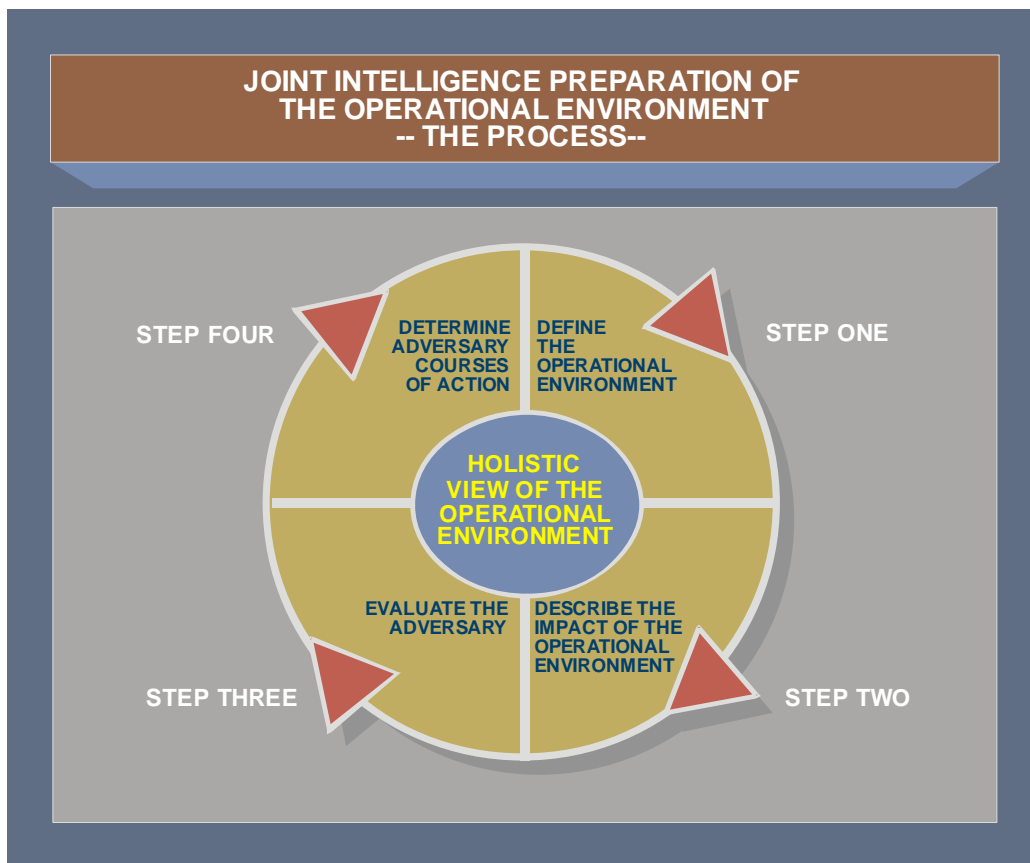


Figure II-1. Joint Intelligence Preparation of the Operational Environment  
– The Process



Military operations that may require slightly different techniques and areas of emphasis are addressed in Chapter IV, “Special Considerations,” and are illustrated in Appendix B, “Somalia 1992-1993 – A Case Study of Support to Stability Operations and Irregular Warfare.”

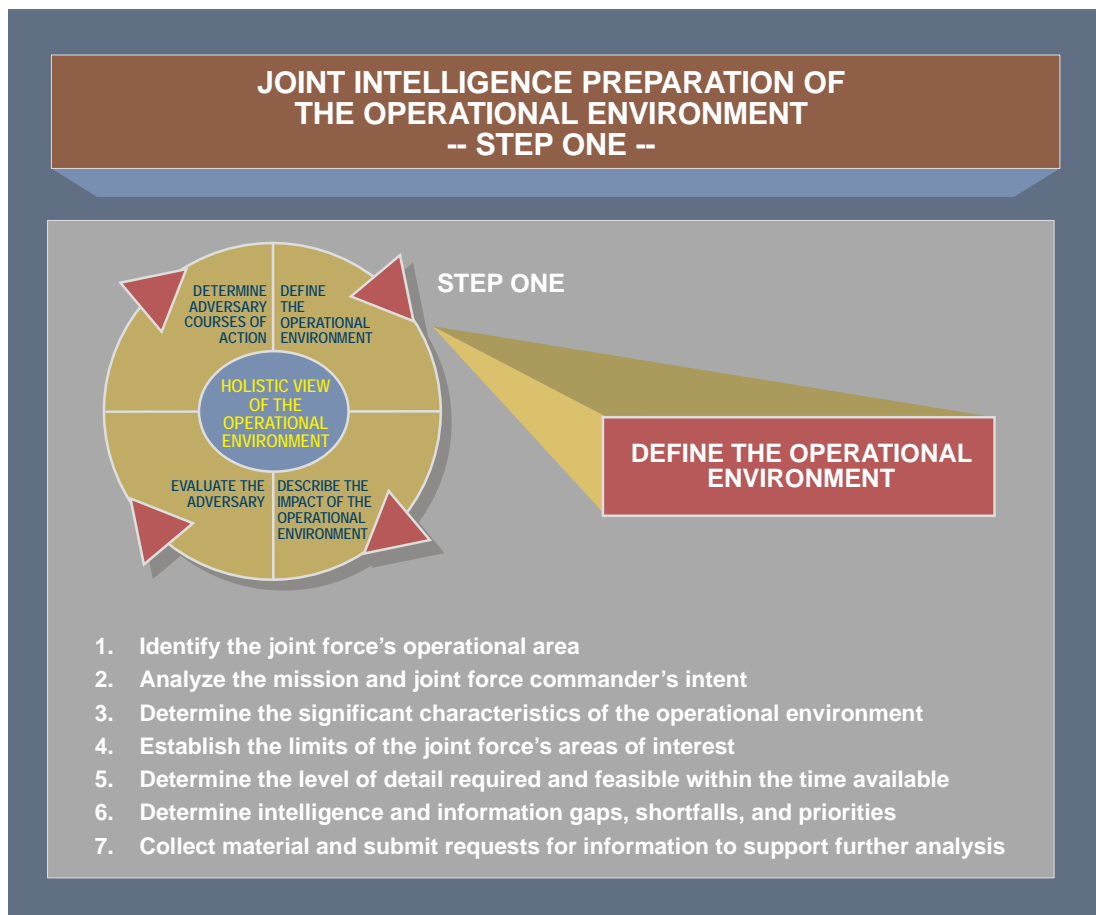
### SECTION A. DEFINING THE OPERATIONAL ENVIRONMENT

*“Unrestricted war is a war that surpasses all boundaries and restrictions. It takes nonmilitary forms and military forms and creates a war on many fronts. It is the war of the future.”*

**Colonel Qiao Liang and Colonel Wang Xiangsui,**  
*Unrestricted War, Beijing, 1998*

## 2. Overview

In the first step of the JIPOE process, the joint force staff assists the JFC and component commanders in defining the operational environment by identifying those aspects and significant characteristics that may be relevant to the joint force’s mission (see Figure II-2). The J-2 staff works with other joint force and component command staff elements to formulate an initial survey of adversary and other relevant



**Figure II-2. Joint Intelligence Preparation of the Operational Environment – Step One**

characteristics that may impact both friendly and adversary operations. This cursory survey of general characteristics is used by the JFC and joint force staffs to visualize the operational environment, delineate the AOI, determine information and intelligence gaps and collection requirements, develop realistic assumptions, and provide guidance and direction to the JIPOE effort.

a. Successfully defining the command's operational environment is critical to the outcome of the JIPOE process. The succeeding steps of the JIPOE process must concentrate on those aspects and characteristics of the operational environment that could influence the accomplishment of the joint force's mission. Correctly defining the relevant aspects of the operational environment during this step saves time and effort by focusing the work of the joint force staff on only those characteristics that could influence the JFC's decisions and the selection of friendly COAs.

(1) The geospatial aspects of the operational environment are defined within the common World Geodetic System reference framework in accordance with Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3900.01C, *Position (Point and Area) Reference Procedures*. Any associated GI&S products developed or used should meet the standards and guidelines of the National Geospatial-Intelligence Agency.

*For a detailed discussion of GI&S standards, refer to JP 2-03, Geospatial Intelligence Support to Joint Operations.*

(2) The joint force staff must also recognize and understand those aspects of the operational environment that transcend the physical characteristics and elements. A holistic view of the operational environment includes nonphysical aspects that may directly affect, but extend well beyond, the designated operational area. Examples of these nonphysical aspects include international public opinion, economic policies, CNO, and complex sociocultural factors and relationships.

b. Failure to focus on the **relevant** characteristics of the operational environment leads to wasted time and effort. A poorly focused JIPOE effort may result in the collection and analysis of unnecessary information. More importantly, the failure to identify **all** relevant characteristics may lead to the joint force's being surprised and unprepared when some overlooked aspect of the operational environment exerts an influence on the accomplishment of the joint force's mission.

### 3. Identifying the Joint Force's Operational Area

When warranted, geographic combatant commanders (GCCs) may designate theaters of war and subordinate theaters of operation for each major threat. The boundaries of these areas are normally specified in the operation order or operation plan (OPLAN) from the higher headquarters that assigned the joint force's mission. To assist in the coordination and deconfliction of joint action, JFCs may define operational areas. The size of these areas, and the types of forces employed within them, depend on the scope and nature of the crisis and the projected duration of operations. For operations

somewhat limited in scope and duration, GCCs can designate operational areas such as joint operations areas (JOAs), joint special operations areas, joint security areas (JSAs), amphibious objective areas, or areas of operations. Operational areas may be contiguous or noncontiguous. Contiguous operational areas are separated by boundaries, while noncontiguous areas do not share a common boundary. Normally, noncontiguous operational areas are characterized by specially designated boundaries and elements of the force that are linked by the CONOPS. The higher headquarters is responsible for the areas between noncontiguous operational areas.

#### 4. Analyzing the Mission and Joint Force Commander's Intent

Mission analysis is normally accomplished under the leadership of the JFC and in cooperation with the joint force staff as part of the commander's planning process. The JFC's stated intent and all characteristics of the mission that could influence the JFC's decisions or affect the COAs available to the joint force or the adversary are of special significance to the JIPOE process. In many situations, those characteristics of the joint force's operational environment will extend far beyond the designated limits of the operational area. For example, in order to protect the force, the JFC should conceptualize the operational environment as including the surface-to-air missiles, cruise missiles, and theater ballistic missiles possessed by any third party nations or potentially hostile groups that could threaten friendly operations, even though they may be located outside the designated boundaries of the operational area. Mission characteristics that could be important include the type of military operation being considered or planned; the purpose of the operation; the amount of time available for planning and execution; the expected duration of the operation; the risks to be managed; and whether allied or coalition forces will be involved. The analyst must also consider the operational limitations (constraints and restraints) levied upon the JFC by the national military leadership which would impact the conduct of operations. For example, restrictions on civilian casualties and declarations of no-strike objects or entities will provide a framework for the scope of the JFC's mission and directly influence the JIPOE effort.

#### 5. Determining the Significant Characteristics of the Operational Environment

This step consists of a  *cursory* examination of each aspect of the operational environment in order to identify those characteristics of  *possible* significance or relevance to the joint force and its mission. For example, during this step the analysis of adversary and third party military forces is limited to the identification of those forces that could influence the joint force's mission based on their location, mobility, general capabilities, significant weapons ranges, and strategic intent. A more  *in-depth* evaluation of the impact of each relevant characteristic of the operational environment takes place during step two of the JIPOE process, which is discussed in Section B, "Describing the Impact of the Operational Environment." Specific adversary capabilities and possible COAs are evaluated  *in detail* during the third step of the JIPOE process, which is discussed in Section C, "Evaluate the Adversary."

a. Certain characteristics of the operational environment may take on added significance based on the type of mission assigned to the joint force. For example, the presence of civilian relief organizations would be an important factor during a foreign humanitarian assistance operation. During a counterdrug operation, significant characteristics might include the relationships among narcotics trafficking organizations and the governments in the region. During major operations, significant characteristics of the operational environment would include the locations of critical resources (such as sources of water during desert operations), the adversary's LOCs and external sources of supply, and the location and viability of friendly and third-party forces. Depending on the assigned mission, economic trade between the adversary and third party nations could influence the JFC's decision-making process.

b. When identifying the significant characteristics of the operational environment, all aspects that might affect accomplishment of the joint force's mission must be considered. Depending on the situation, these might include the following:

- (1) Geographical features and METOC characteristics.
- (2) Population demographics (ethnic groups, ideological factions, religious groups and sects, age distribution, income groups, public health issues).
- (3) Political and socioeconomic factors (economic system, political factions).
- (4) Infrastructures, such as transportation and information systems.
- (5) Operational limitations such as ROE, RUF, or legal restrictions on military operations, as specified in international treaties or agreements.
- (6) All friendly and adversary conventional, unconventional, and paramilitary forces and their general disposition, capabilities, and strategic objectives.
- (7) Environmental conditions (earthquakes, volcanic activity, pollution, naturally occurring diseases).
- (8) Psychological characteristics of adversary decision making.
- (9) All locations of foreign embassies, IGOs, and NGOs.
- (10) Attitude and perception of local population toward the United States and coalition partners.

## 6. Establishing the Limits of the Joint Force's Area of Interest

The operational environment encompasses all characteristics, factors, and conditions that must be understood to successfully apply combat power, protect the force, or complete the mission. However, not all of these aspects are relative to *intelligence*

responsibilities or capabilities. For example, the logistic capabilities, military training, and morale of *friendly* forces fall outside the responsibilities of JIPOE. Therefore, the JFC and J-2 should identify and establish limits for those physical areas and nonphysical aspects of the operational environment that are deemed relevant to the JIPOE effort.

a. **Physical Areas.** The pertinent physical areas in the operational environment include the assigned operational areas and the associated areas of influence and AOIs described below. Designation of the areas of influence and interest help commanders and staffs order their thoughts during both planning and execution, and help focus the JIPOE effort.

(1) An **area of influence** is a geographic area in which a commander can directly influence friendly operations, adversary actions, or the activity and perception of the local populace. The area of influence normally surrounds and includes the assigned operational area. The extent of a subordinate command's area of influence is one factor the higher commander considers when defining the subordinate's operational area. Understanding the command's area of influence helps the commander and staff plan branches to the current operation that could require the force to employ capabilities outside the assigned operational area.

(2) An AOI is that area of concern to the commander, including the area of influence, areas adjacent thereto, and extending into enemy territory to the objectives of current or planned operations. An AOI serves to focus intelligence support for monitoring adversary, neutral, or other activities outside the operational area that may affect current and future operations. The AOI can be well outside of the area of influence and is not restricted by political boundaries. In combat operations for example, the AOI normally extends into enemy territory to the objectives of current or planned friendly operations if those objectives are not currently located within the assigned operational area. Likewise, if a neighboring country's political developments or support for the adversary might affect the joint force's mission accomplishment, the JFC should include that country within the AOI. The commander can describe the AOI graphically, but the resulting graphic does not represent a boundary or other control measure.

(a) A key consideration in establishing an AOI is the adversary's (and any of its potential allies') capability to project power, provide logistic support, move forces into or through the joint force's operational areas, or conduct overt and covert intelligence operations directed against the joint force. For example, ports and airfields located outside the JOA would be inside the AOI if they could be used to launch sea and air attacks against the joint force, or resupply and/or reinforce the adversary's forces. Likewise, it is important to consider all possible locations from which an adversary or third party may launch terrorist or unconventional warfare attacks against friendly forces or LOCs. Possible launch sites for theater ballistic missiles belonging to a country friendly to the adversary that are capable of striking or influencing targets within the operational area should be included in the AOI.

(b) Time is another important factor in establishing the limits of an AOI. When addressing the relationship between time and the AOI, the JIPOE analyst must consider both the adversary's mobility (land, air, maritime, and space) and the amount of time needed to accomplish the friendly mission. For example, if a JFC estimates that it will take 48 hours to complete an operation, the AOI must encompass all adversary forces or activities that could influence mission accomplishment within that timeframe. For missions that are of relatively short duration, such as noncombatant evacuation operations or raids, the immediate and direct threats to the operation may be the only considerations. In those cases, the AOI might be relatively small. Some long-term missions, such as nation building, will result in an extensive AOI that involves many political and economic factors as well as more traditional military factors.

**b. Nonphysical Aspects.** The joint force staff should also look beyond the "obvious" geospatial limits of the AOI by identifying any nonphysical factors that may impact the accomplishment of the joint force's mission. Many of these factors transcend the traditional concept of physical boundaries and have worldwide implications and relevance. For example, the Internet has made it possible for even relatively unsophisticated adversaries to access commercial satellite imagery and other significant sources of information on a worldwide basis. Likewise, the friendly and adversary use of the electromagnetic spectrum, time as it relates to decision making, friendly and adversary information systems capabilities and vulnerabilities, the perceptions and attitudes of the leadership and population both inside and outside the operational area, and the relationships (links) among various adversary PMESII system nodes are some examples of nonphysical aspects of the joint force's AOI that should be considered.

## **7. Determining the Level of Detail Required and Feasible within the Time Available**

The time available for completion of the JIPOE process may not permit each step to be conducted in detail. Overcoming time limitations requires focusing on the parts of the JIPOE process that are most important to the JFC and subordinate commanders in planning and executing the joint mission. Identifying the amount of detail required to answer the JFC's PIRs avoids wasting time on developing more detail than necessary on any one step of the process.

a. Some situations may not require an analysis of all adversary forces or other aspects of the operational environment. For example, those adversary forces within the AOI that cannot interfere with the joint operation may require only a summary of their capabilities. In some cases, only select aspects of the operational environment may require detailed analysis based on the type of assigned mission or other planning considerations.

b. The J-2 consults the JFC and other staff elements to determine the amount of detail regarding the operational environment that is required to support operation planning. The J-2 plans, prioritizes, and structures the JIPOE effort by balancing the level of detail required with the amount of time available.



### **8. Determining Intelligence and Information Gaps, Shortfalls, and Priorities**

The J-2 staff evaluates the available intelligence and information databases to determine if the necessary information is available to conduct the remainder of the JIPOE process. Red teams assist the J-2 staff by conducting critical reviews to identify gaps in data and alternative interpretations of the available data used to identify and analyze the relevant physical and nonphysical aspects of the operational environment. In nearly every situation, there will be gaps in existing databases and shortfalls in the ability of the J-2 to fill all of these gaps. These gaps and shortfalls must be identified early in order for the joint force staff to initiate the appropriate intelligence requirements. The J-2 will use the JFC's stated intent, commander's critical information requirements, and initial PIR to establish priorities for intelligence collection, processing, production, and dissemination.

a. The J-2 must identify and inform the JFC and appropriate staff elements of any intelligence and information gaps that cannot be filled within the time allowed for JIPOE.

b. When necessary, the J-2 staff should formulate reasonable assumptions based on historical or current facts to fill in the gaps. During the remainder of the JIPOE process, and during the commander's decision-making process, the J-2 must ensure that any assumptions that have been made are clearly identified as such.

c. Intelligence analysts should review web-based sites (at all available classification levels) and databases for information that may be applicable to the JIPOE effort. For example, Intellipedia is an Intelink-based encyclopedia of intelligence-related articles and information. The Intellipedia article on "Intelligence Databases" contains an extensive listing of, and hyperlinks to, current databases which may be of interest to JIPOE analysts. These databases should be reviewed and evaluated to determine the availability of current data, information, and intelligence products relative to the joint force's operational environment and mission.

### **9. Submitting Requests for Information to Support Further Analysis**

a. Collecting data and incorporating it into the JIPOE process is a continuous effort. The J-2 staff initiates collection operations and issues RFIs to fill intelligence gaps to the level of detail required to support the JIPOE effort. As additional information and intelligence is received, the J-2 staff and JIOC update all JIPOE products.

b. When new intelligence confirms or repudiates assumptions, the J-2 informs the JFC and component commanders and their staffs. If any assumptions are repudiated by new intelligence, the commander, the J-3, and other appropriate staff elements should reexamine any evaluations and decisions that were based on those assumptions.

## SECTION B. DESCRIBING THE IMPACT OF THE OPERATIONAL ENVIRONMENT

*“Maneuvers that are possible and dispositions that are essential are indelibly written on the ground. Badly off, indeed, is the leader who is unable to read this writing. His lot must inevitably be one of blunder, defeat, and disaster.”*

***Infantry in Battle***  
**US Army Command and**  
**General Staff School, 1939**

### 10. Overview

The second step in the JIPOE process evaluates the impact of the operational environment on adversary, friendly, and neutral military capabilities and broad COAs (see Figure II-3). All relevant physical and nonphysical aspects of the operational environment are analyzed by JIPOE analysts, combatant command personnel, and GEOINT analysts to produce a geospatial perspective. Likewise, a systems perspective is developed through the analysis of relevant sociocultural factors and system/subsystem nodes and links. Products developed during this step might include, but are not limited to, overlays and matrices that depict the military impact of geography, METOC factors, demographics, and the information environment. Other products include assessments of sociocultural factors and network analysis diagrams associated with adversary and neutral PMESII and other systems.

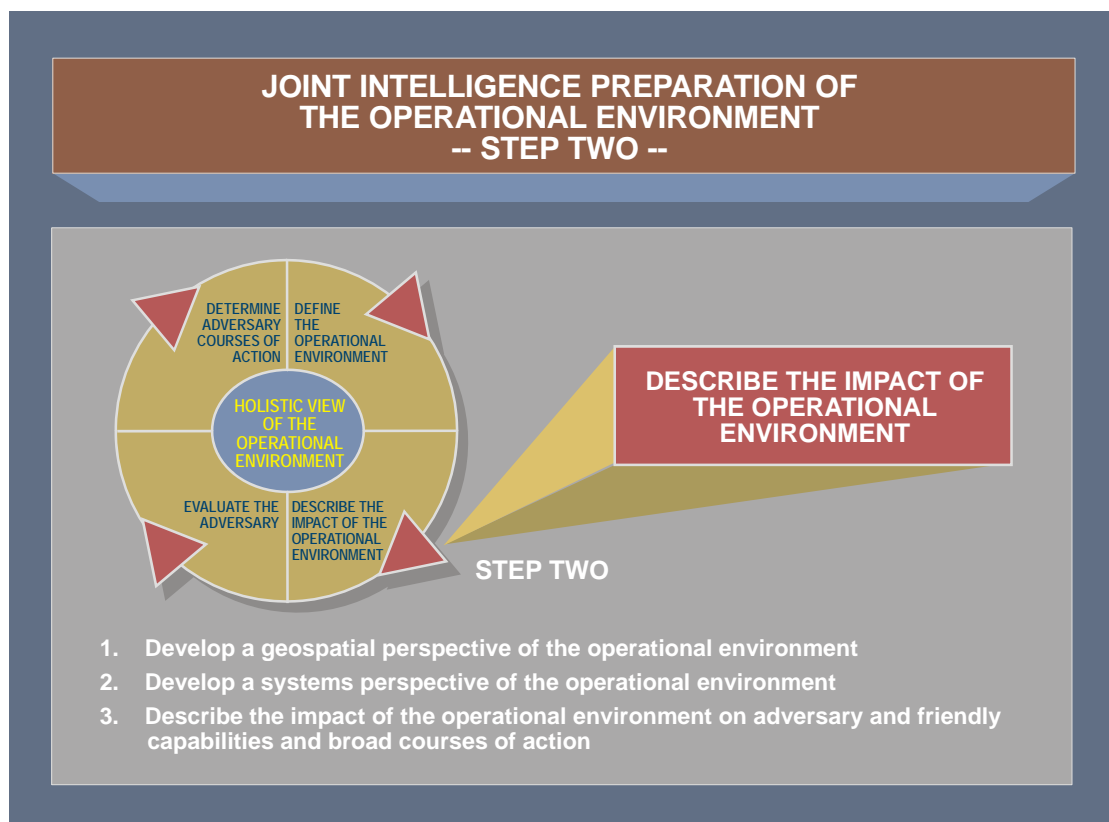


Figure II-3. Joint Intelligence Preparation of the Operational Environment – Step Two



## 11. Developing a Geospatial Perspective of the Operational Environment

A geospatial perspective supports all views of the operational environment by helping to analyze relevant physical, nonphysical, and locational aspects of the operational environment. Each aspect of the operational environment is assessed in a two-step process which analyzes its relevant characteristics and evaluates its potential impact on military operations. Due to the requirements of military planning, the analysis of the joint force's operational areas will generally require more detail than that of the AOI. Additionally, since the physical aspects of the operational environment are not homogeneous, various land and maritime areas may require greater or lesser analysis depending on the relative geographical complexity of the region. METOC conditions are considered both in terms of their ability to modify individual aspects of the operational environment as well as their capability to directly affect overall military operations. For example, although heavy rainfall may influence the land domain by swelling streams and degrading soil trafficability, it can also impact other aspects of the operational environment, by reducing overhead reconnaissance capabilities, degrading some types of radio communications, or limiting the effectiveness of some air, ground, and naval weapons systems. Analysis should also focus on the impact of the environment and weather on chemical, biological, radiological, and nuclear (CBRN) collateral effects. The destruction of nuclear reactors and CBRN weapons production and storage facilities presents special problems. For each known location of CBRN facilities, the surrounding terrain and forecasted weather conditions and patterns should be analyzed to facilitate modeling of post-attack effluent contamination. Potential dispersal patterns should be drawn downwind from each site to facilitate understanding the potential extent of contamination.

a. **The Land Domain.** Analysis of the operational environment's land domain concentrates on terrain features such as transportation systems (road and bridge information), surface materials, ground water, natural obstacles such as large bodies of water and mountains, the types and distribution of vegetation, and the configuration of surface drainage. Terrain analysis must always consider the effects of weather as well as changes that may result from military action. For example, freezing temperatures may eliminate the obstacle value of rivers or marshes by freezing the surface sufficiently to allow operational maneuver. Likewise, the mobility characteristics of the operational area can be affected by military actions that may reduce built-up areas to rubble, destroy dams and bridges, and possibly create large concentrations of refugees blocking LOCs. It is also important to analyze the combined effects of wind, temperature, humidity, sunlight, topography, and precipitation on the potential use of chemical and biological weapons in order to take appropriate defensive measures. The first step in this process is to analyze the military aspects of the terrain (observation and fields of fire, concealment and cover, obstacles, key terrain, and avenues of approach). This analysis is followed by an evaluation of how the land domain will affect military operations. It is important to remember that terrain analysis is not the end product of the JIPOE process. Rather, terrain analysis is the means to determine which friendly COAs can best exploit the opportunities the terrain provides and how the terrain affects the adversary's available COAs.

(1) **Observation and Fields of Fire.** “Observation” is the ability to see (or be seen by) the adversary either visually or through the use of surveillance devices. A “field of fire” is the area that a weapon or group of weapons may effectively cover with fire from a given position. Areas that offer good observation and fields of fire generally favor defensive COAs. Factors that hinder observation and fields of fire include: the height and density of vegetation and buildings; relief features such as hills and defiles; obstructions to specific lines of sight; target acquisition and sensor capabilities; and precipitation and cloud cover. The analysis of each limiting factor should be combined into a single product. Additionally, if time permits, line of sight overlays should be prepared to assist the joint force staff in evaluating potential friendly or adversary COAs, operational avenues of approach, and the employment of line of sight ground and aerial joint sensors and communications networks. The evaluation of observation and fields of fire facilitates the identification of--

- (a) Potential engagement areas or “kill zones;”
- (b) Defensible terrain and specific system or equipment positions; and
- (c) Areas where maneuvering forces are most vulnerable to observation and fire.

(2) **Concealment and Cover.** “Concealment” is protection from observation, and can be provided by features such as woods, underbrush, snowdrifts, tall grass, and cultivated vegetation. “Cover” is protection from direct and indirect fires. It can be provided by such things as ditches, caves, tunnels, river banks, folds in the ground, shell craters, buildings, walls, and embankments. Areas with good concealment and cover favor both offensive and defensive COAs. Since concealment and cover are basically the inverse of observation and fields of fire, the analysis of all four of these categories should be integrated in order to--

- (a) Identify defensible terrain and potential battle positions;
- (b) Evaluate avenues of approach; and
- (c) Identify potential assembly and dispersal areas.

(3) **Obstacles.** Obstacles are obstructions designed or employed to disrupt, fix, turn, or block the movement of an opposing force, and to impose additional losses in personnel, time, and equipment on the opposing force. Obstacles can be natural, man-made, or a combination of both. These can include buildings, steep slopes, rivers, lakes, forests, swamps, jungles, cities, minefields, trenches, and military wire obstacles. An evaluation of obstacles leads to the identification of mobility corridors. This, in turn, helps to identify defensible terrain and avenues of approach.

- (a) If time permits, separate obstacle overlays should be prepared to evaluate each of the following categories and factors: vegetation density; surface

drainage (stream fordability, swampy areas); natural and man-made obstacles; transportation infrastructure (bridge classifications and road width, slope, and curve radius); the lethality and area of dispersion of chemical and biological agents and radiation; and the effects of current or projected METOC conditions. Each of these factor overlays are then combined to form a single product known as the combined obstacle overlay (see Figure II-4).

(b) The combined obstacle overlay is used to depict areas where military mobility can be categorized as unrestricted, restricted, or very restricted. Unrestricted areas are free of any obstacles or restrictions to movement. Restricted areas are usually depicted on overlays by diagonal lines to indicate terrain that hinders movement to some degree. Very restricted areas are usually depicted by crosshatched diagonal lines to indicate terrain that severely hinders or slows military movement unless some effort is made to enhance mobility. These terrain mobility classifications are not absolute but reflect the relative effect of terrain on types of forces and combat maneuver formations. They are based on the ability of a force to maneuver in combat formations, usually linear, or to transition from one type of formation to another, as opposed to simply moving through a piece of terrain. Identifying an area as “very restricted” terrain, for example, does not imply that movement through that area is impossible, only that in some military

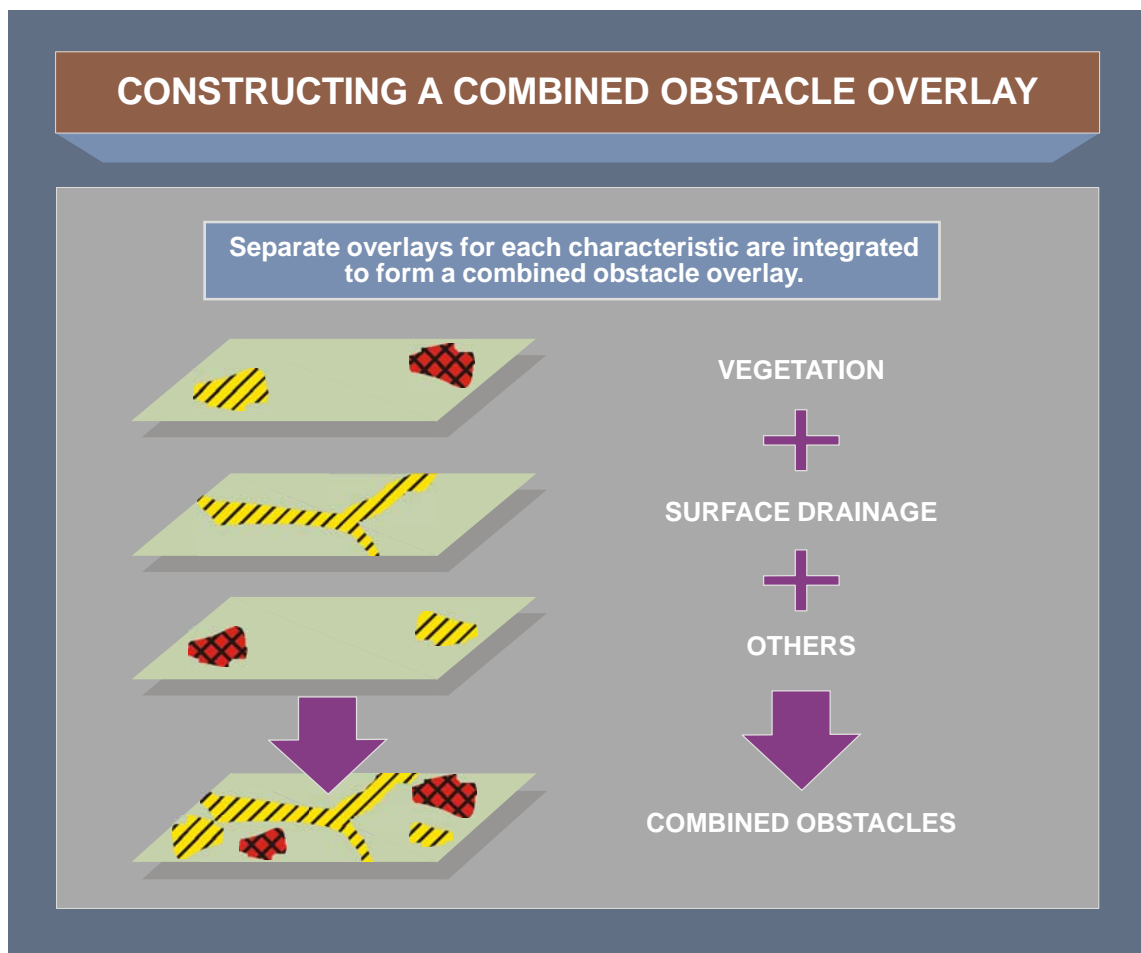


Figure II-4. Constructing a Combined Obstacle Overlay

operations it may be impractical. Units moving in column formations along roads generally have little trouble traversing very restricted terrain.

#### **GERMAN ARMOR IN THE ARDENNES FOREST**

**Intelligence analysts must exercise caution in assessing restrictive terrain. During World War II, German armored forces defied conventional military wisdom and maximized surprise by attacking through the “impassable” Ardennes Forest. As the following extract points out, the Allies were surprised not once, but twice.**

**“Success in the preservation of secrecy had been a major factor in surprising the French High Command in May 1940. The point on which the main weight of the German offensive would fall had been concealed up to the last moment. By the time French forces had reached the Meuse between Givet and Namur, the German armored divisions were already in sight of the Semois and the French had been surprised while still on the move. But this had happened in the spring and French general staff theory had been that the Ardennes were impassable.**

**Guderian’s breakthrough at Sedan had shown up the fallacy of the theory of the Ardennes ‘fortress’. But four years later no one imagined that the same blow would be repeated. The American generals may have been inexperienced on the battlefield, but they had almost certainly studied the 1940 operation.”**

**SOURCE: Jacques Nobecourt  
*Hitler’s Last Gamble: The Battle of the Bulge***

(4) **Key Terrain.** Key terrain is any area the seizure, retention, or control of which affords a marked advantage to either force. Therefore, it is often selected as a decisive point and a tactical-level or operational-level objective. Certain key terrain, such as an airport or seaport, could be designated as an operational-level objective if it significantly affects the JFC’s ability to deploy or employ joint force components. For example, an operational commander may consider as key terrain an urban complex that is an important transportation center, a road network providing passage through restrictive terrain, or a geographic area that provides critical agricultural, industrial, or natural resources. Key terrain is evaluated by assessing the impact of its seizure by either force upon the results of battle. There are two suggested techniques to assist this analysis.

(a) Evaluate the other four military aspects of the terrain first; then integrate those results to identify and assess key terrain. For example, key terrain might include a range of hills with good observation and fields of fire overlooking an area providing adversary forces a number of high-speed avenues of approach.

(b) Time permitting, conduct a “mini-wargame” to visualize possible outcomes of battle. Key terrain is commonly depicted on overlays with a large “K” within a circle or curve that encloses and follows the contours of the designated terrain. In the offense, key terrain features are usually forward of the friendly force and are often

assigned as objectives. In the defense, key terrain is usually within or behind the defensive area and should offer good observation over avenues of approach, and permit the defender to cover an obstacle by fire.

(c) Additional considerations include the following:

1. Key terrain varies with the level of command. For example, a large city may represent an important objective to an operational-level commander, whereas a tactical commander may consider it to be an obstacle.

2. Terrain which permits or denies maneuver, such as bridges or chokepoints, may be key terrain.

3. Major obstacles rarely constitute key terrain. Thus, the high ground dominating a river, rather than the river itself, is considered key terrain.

4. Key terrain may include areas and facilities that may have an extraordinary impact on mission accomplishment (e.g., theater ballistic missile launch facilities, cruise missile launch sites, airfields).

(5) **Avenues of Approach.** An avenue of approach is a route of an attacking force of a given size leading to its objective or to key terrain in its path. The identification of avenues of approach is important because all COAs that involve maneuver depend upon available avenues of approach. During offensive operations, avenues of approach are evaluated in terms of their ability to facilitate friendly maneuver to the objective and the adversary's capability to withdraw from, or reinforce, the objective. Conversely, during defensive operations, avenues of approach are analyzed in relation to their ability to facilitate an adversary's attack on friendly positions and the capability of friendly forces to reinforce the battle area. Avenues of approach should be analyzed using the following procedures:

(a) **Identify Mobility Corridors.** Mobility corridors are areas relatively free of obstacles where a force can capitalize on the principles of mass and speed, but is canalized due to restrictive terrain along both flanks. In conventional operations, the combined obstacles overlay is used to identify mobility corridors wide enough to permit tactical maneuver. The best corridors contain unrestricted terrain wide enough to permit a force to move in its preferred doctrinal formations while avoiding major obstacles. Normally, mobility corridors are identified for forces two echelons below the size of the friendly force. Mobility corridors also depend on the type and mobility of the force being evaluated. For example, mechanized and armored units generally require large open areas, while dismounted infantry units, insurgents, and terrorists are less hindered by rough terrain and prefer areas that provide some concealment and cover. Infiltrators may actually avoid mobility corridors altogether and instead use routes along ridge lines or defiles.

(b) **Categorize Mobility Corridors.** Mobility corridors should be categorized according to the size or type of force they can accommodate, such as a mechanized division or an armored brigade. The mobility corridors may also be prioritized in order of likely use. For example, a corridor through unrestricted terrain supported by a road network is generally more desirable than one through restricted terrain without a road.

(c) **Group Mobility Corridors to Form Avenues of Approach.** Two or more mobility corridors are grouped together to form avenues of approach (see Figure II-5). This grouping may be based on factors such as crossover (gaps in the restrictive terrain separating mobility corridors) or two or more corridors that lead to the same objective. Avenues of approach are normally identified for forces one echelon lower than the friendly command, and may include areas of severely restricted terrain. Avenues of approach are depicted using arrows that encompass the mobility corridors constituting the avenue.

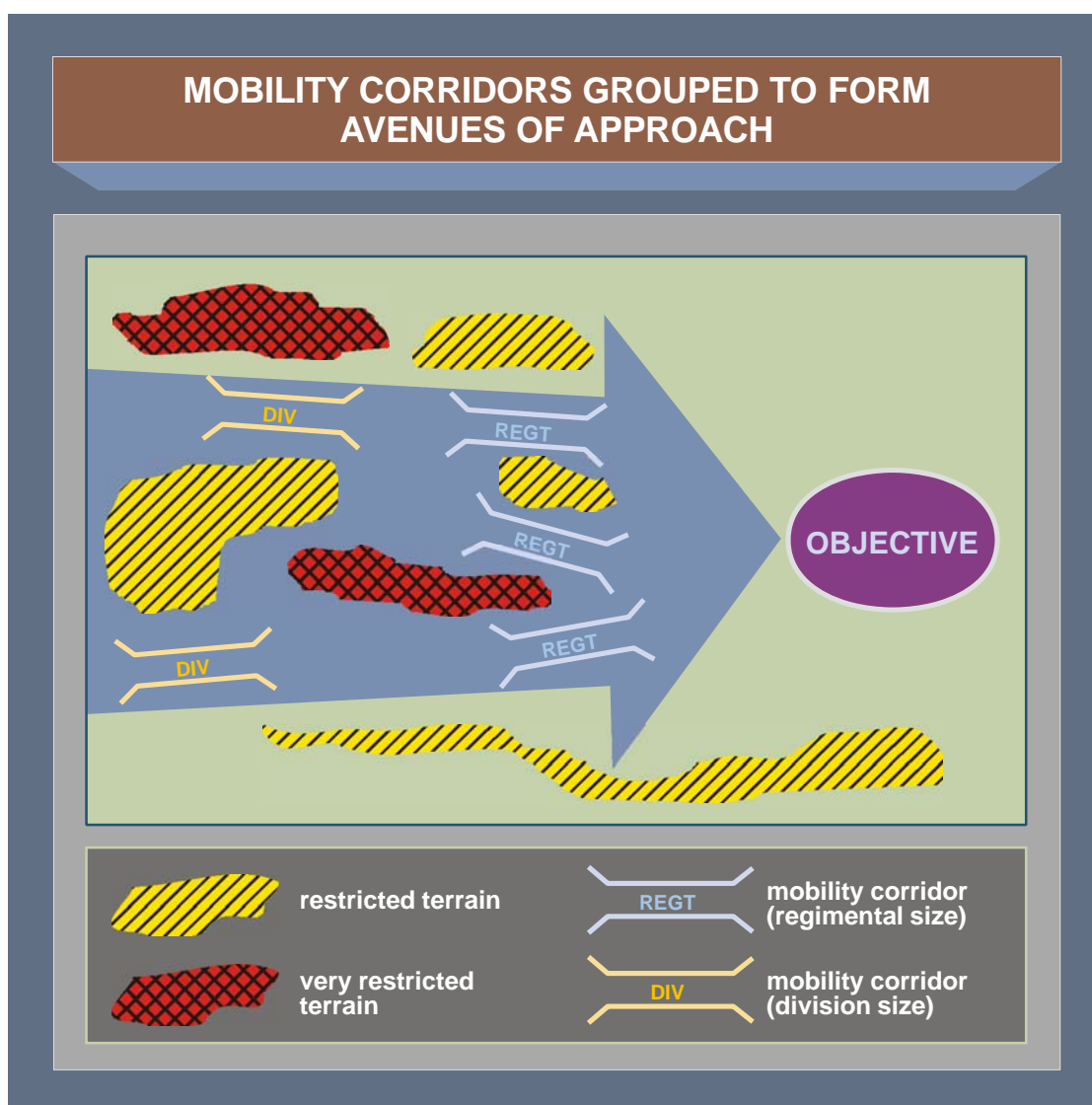


Figure II-5. Mobility Corridors Grouped to Form Avenues of Approach



(d) **Evaluate Avenues of Approach.** Avenues of approach are evaluated to identify those which best support maneuver capabilities. Each avenue is evaluated in terms of its suitability for access to key terrain and adjacent avenues, degree of canalization and ease of movement, use of concealment and cover, use of observation and fields of fire, sustainability through LOCs, and directness to the objective.

(e) **Prioritize Avenues of Approach.** Each avenue of approach is prioritized based on its overall ability to support maneuver.

(6) **Evaluate the Impact of the Land Domain on Military Operations.** The final step in analyzing the land domain is to relate the evaluation of the military aspects of the terrain to the various broad COAs available to friendly and adversary ground forces. For this purpose, the COAs are generally limited to offense, defense, reinforcement, and retrograde operations. The possible impact of the terrain on each COA are analyzed by identifying areas along each avenue of approach that are suitable for use as potential engagement areas, ambush sites, battle positions, and immediate or intermediate objectives. Engagement areas and ambush sites are usually located in areas with minimal cover and concealment where a maneuvering force will be vulnerable to fire from adversary weapons. Conversely, battle positions are usually selected based on the availability of cover and concealment as well as good observation and fields of fire. The terrain rarely favors one type of operation or COA throughout the entire width and breadth of the operational environment. For example, areas with poor battle positions and minimally acceptable engagement areas usually favor the offense, whereas the defense is facilitated by good battle positions. Areas of the operational environment where the terrain predominantly favors one COA over others should be identified and graphically depicted. The most effective graphic technique is to construct a modified combined obstacle overlay (MCOO) by depicting (in addition to the restricted and severely restricted areas already shown) such items as avenues of approach and mobility corridors, counter-mobility obstacle systems, defensible terrain, engagement areas, and key terrain (see Figure II-6). The results of terrain analysis should be disseminated to the joint force staff as soon as possible, and made available to subordinate and supporting commanders and their staffs, by way of the intelligence estimate, analysis of the operational area, and the MCOO.

b. **The Maritime Domain.** The maritime domain - the world's oceans, seas, bays, estuaries, islands, coastal areas, littorals, and the airspace above them - is a vast maneuver space that allows for tactical maneuver in the air, on the surface, and beneath the surface of the water. However, even in open ocean areas, distant land masses and supporting shore infrastructure may impact naval operations primarily due to the range of an adversary's weapons systems and sensors. Littoral areas may contain geographic features such as straits or chokepoints that restrict tactical maneuver or affect weapon and sensor effectiveness. Maritime geography should be examined in both the open ocean and littoral portions of the operational area and AOI. Key military aspects of the maritime domain can include maneuver space and chokepoints; natural harbors and anchorages; man-made infrastructures; sea lines of communications (SLOCs), and ocean surface and subsurface characteristics.

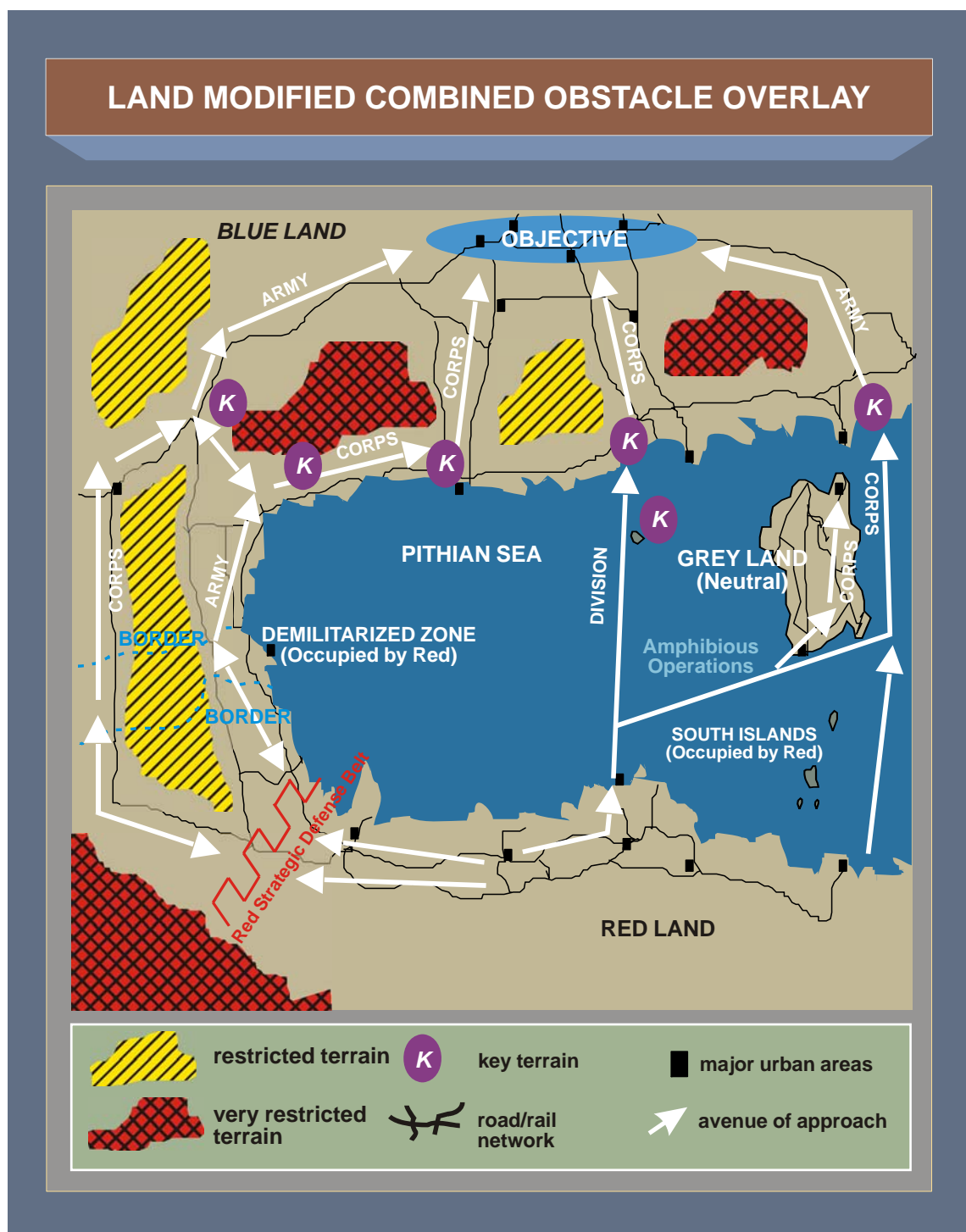


Figure II-6. Land Modified Combined Obstacle Overlay

(1) **Maneuver Space and Chokepoints.** Surface ships compensate for the sea's lack of cover and concealment by utilizing maneuver to reduce an adversary's ability to locate them at a specific time and place. Confined ocean space limits the ability to maneuver a ship, thus increasing the danger that it can be located and engaged. Additionally, the proximity of a surface ship to land increases the potential threat from an



### THE BATTLE OF THE ATLANTIC AND THE CHANGING MARITIME DOMAIN

The increased range of modern weapons and sensors means that even distant land masses may have an important impact upon naval operations. During the Battle of the Atlantic in World War II, German U-boats took advantage of the mid-Atlantic gap. This was an area in the North Atlantic along the sea lines of communications between North America and Great Britain that was outside of the patrol range of allied land based antisubmarine aircraft. It was bounded by the range fans of allied antisubmarine aircraft flying from bases in North America, Greenland, Bermuda, the Azores, Iceland, and the British Isles. However, as the war progressed, antisubmarine escort carrier groups were introduced and the range of allied patrol aircraft increased, thereby reducing the “gap” in airborne coverage that the U-boats could exploit without worry of air attack. Thus the location of seemingly distant islands in the Atlantic had an increased impact upon German U-boat operations in the open ocean due to improved allied technology.

SOURCE: Various Sources

adversary’s antiship missiles and aircraft. A ship operating in confined waters near an adversary’s shore-based air or missile assets may have insufficient warning time available to counter an incoming air threat. This is because the effectiveness of a ship’s air defense system is largely dependent on the range at which an air threat can be detected. Chokepoints such as straits or narrows are extremely hazardous areas due to their ability to severely limit tactical maneuver. This effect is magnified for task force operations, as some ship formations may be forced to “close up” in a confined water space and the area required for a multiship formation to maneuver is significantly greater than for an individual ship. Finally, the effectiveness of sea mines can be greatly enhanced in confined waters.

(2) **Natural Harbors and Anchorages.** Natural harbors and anchorages may be exploited by friendly or adversary naval forces and should be identified and analyzed. Depending on the surrounding terrain, some natural harbors and anchorages, such as fjords, may offer limited camouflage and concealment for naval combatants and may afford the adversary an opportunity to launch unexpected sorties against friendly ships. Likewise, friendly forces may utilize these areas as havens to frustrate an adversary’s attempts to locate and target them.

(3) **Man-made Infrastructure.** All man-made infrastructure capable of influencing naval operations in the AOI should be identified and analyzed. This includes civilian port facilities, naval bases, airfields, and occupied and unoccupied antiship missile sites. The capacity of civilian port facilities is particularly important when analyzing adversary and friendly logistic support capabilities. Naval bases should be analyzed in relation to how well they are positioned to support sea control, power projection, or amphibious operations in adjacent waters.

(4) **Sea Lines of Communications.** SLOCs should be identified and analyzed with regard to their relative importance to adversary, friendly, and neutral countries in the AOI. Potential interdiction areas (such as chokepoints) along SLOCs should be

identified along with the naval bases, coastal defense facilities, and airfields from which such interdiction operations might originate. Additional factors for consideration include the type, density, and ease of identifying shipping along the SLOCs.

(5) **Ocean Surface Characteristics.** Although seemingly uniform, the ocean surface environment actually varies widely depending on METOC conditions. Whenever possible, a historical database should be compiled that evaluates the effects of seasonal weather variations on maritime surface conditions throughout the AOI. Important considerations include winds and temperature. Winds and storms provide the mechanism for wave formation, and therefore determine the roughness of the ocean surface or sea state. Relative sea state is a major factor in determining the feasibility of naval operations and the functionality of maritime weapons platforms. Another important weather variable is temperature, which controls the extent of ice formation and the strength and direction of ocean currents. The presence of ocean ice is a significant seasonal variable that directly affects navigation, port operations, and harbor availability. In some instances, severe ice conditions may force naval units to seasonally redeploy to alternate bases.

(6) **Ocean Subsurface Characteristics.** The subsurface characteristics of the ocean are crucial to the conduct of submarine, antisubmarine, and mining operations (collectively known as undersea warfare). Sonar capabilities are significantly affected by the composition of the sea bottom, saline content and water temperatures at various depths, the presence of ocean currents and eddies, and the ambient noise in various areas of the ocean. Sea bottom contours can provide submarines with a maritime version of terrain masking and avenues of approach. Ocean depth is another subsurface characteristic vitally important to naval operations. Shallow water is advantageous to the use of ocean bottom mines, but its impact on sensors and weapons makes undersea warfare more difficult. Deep water allows greater three-dimensional maneuver room for submarines, but has less impact on undersea warfare sensors and weapons. Ocean depth is particularly crucial when conducting underice operations, as the varying thickness of ocean ice creates a ceiling that may severely restrict a submarine's vertical maneuvering room.

(7) **Littoral Characteristics.** Characteristics such as littoral gradient and composition, coastal terrain features and transportation infrastructure, tides, and currents are critical factors in planning and conducting naval operations. For example, due to the relatively flat trajectory of naval gunfire, coastal ridgelines running perpendicular to the direction of fire facilitate terrain masking. Good amphibious landing sites depend not only on beach gradient and composition, but should also be able to access coastal transportation infrastructure to facilitate the rapid movement inland and the capture of key terrain. Additionally, a historical baseline should be compiled on the impact of various METOC conditions on sea state near potential amphibious operations areas.

(8) **Evaluate the Impact of the Maritime Domain on Military Operations.** The military characteristics of the maritime domain should be evaluated to determine how they may affect adversary and friendly COAs. This should include an evaluation of

various bodies of water and littoral areas in the operational environment to determine if they constitute key geography. For example, the control or denial of a body of water near an amphibious landing site, or adjacent to an avenue of approach running along a coastal plain, may be critical to either friendly or adversary joint operations. The locations of naval bases should be evaluated in relation to their ability to support sea control or amphibious operations in these key geographic areas. Additional key geography might include features such as chokepoints, canals, rivers, harbors, ports, air bases, and islands. The evaluation of potential key geography must be based on the degree to which such maritime features control or dominate the operational environment or give a marked advantage to either adversary or friendly joint COAs; for example, the Strait of Gibraltar and Suez Canal control the ability to reinforce or resupply operations in the Mediterranean Sea and Persian Gulf, air bases in Iceland dominate the North Atlantic shipping lanes in mid-ocean, and Diego Garcia serves as a maritime pre-positioning base to support joint operations in the Indian Ocean and Persian Gulf. Additionally, during amphibious operations, the evaluations of the maritime and land domains should be combined to identify amphibious landing areas that not only can be supported from the sea, but also connect with advantageous land avenues of approach leading to key terrain objectives. Other environmental characteristics to consider include the degree to which areas with limited sea room may limit naval capabilities, areas where ocean subsurface characteristics may degrade sonar or facilitate the use of naval mines (e.g., currents, temperature gradients, and bottom geography), and areas within range of an adversary's land based antiship missile sites and airfields. The locations of the adversary's naval bases should be evaluated in relation to how well they support adversary joint force capabilities to attack, defend, reinforce, or retrograde. Adversary axes and avenues of approach, high-risk areas, low-risk areas, and potential naval engagement areas should be identified. All significant characteristics of the maritime environment should be graphically portrayed on a MCOO (see Figure II-7). The end result should be an evaluation of how the maritime domain helps or hinders sea denial, sea control, power projection, or amphibious operations in and around the key geographic areas identified as crucial to adversary and friendly joint COAs.

c. **Considerations for the Air Domain.** The air domain is the operating medium for fixed-wing and rotary-wing aircraft, air defense systems, unmanned aircraft systems, cruise missiles, and some theater and antitheater ballistic missile systems. Aerial avenues of approach are different from surface avenues. Nevertheless, the air domain is partially influenced by surface characteristics. For example, some military air operations may take advantage of terrain masking. The location or potential location of airfields, missile sites, aircraft carriers, cruise missile submarines, and hardened launch silos also affect air operations and should be considered when analyzing the air domain. Additionally, the effects of METOC conditions on the air domain are particularly crucial. For example, the combination of mountain peaks and a low cloud ceiling may make air operations hazardous or unfeasible for some types of aircraft and optically-guided weapons.

(1) **Target Characteristics and Configuration.** Based on an analysis of the joint force's mission and broad adversary COAs, potential adversary and friendly targets should be identified and analyzed. A target is an entity or object considered for possible

## MARITIME MODIFIED COMBINED OBSTACLE OVERLAY

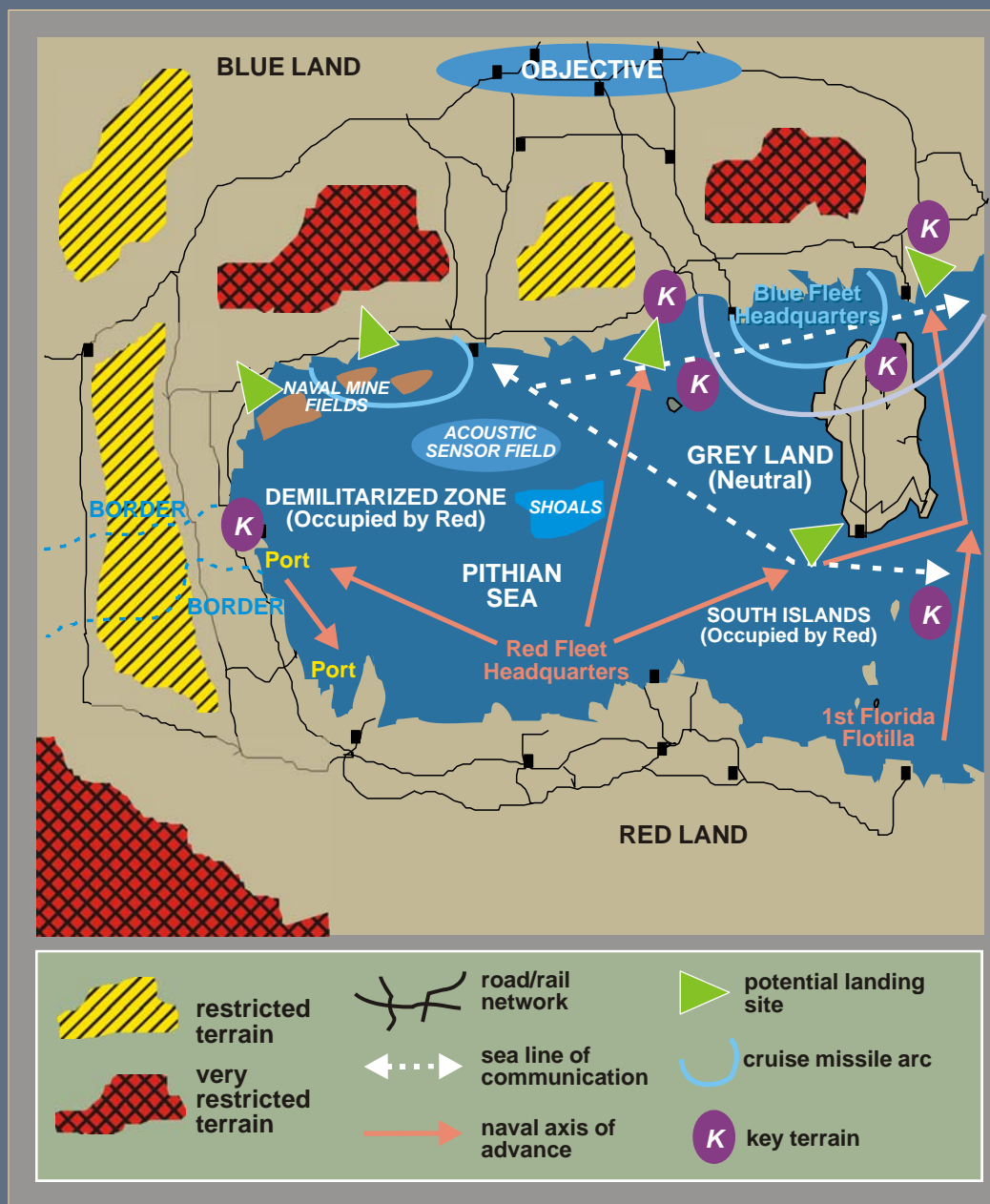


Figure II-7. Maritime Modified Combined Obstacle Overlay

engagement or other action. Targets should be grouped into packages according to whether they would support an adversary's offensive or defensive air posture. For example, adversaries will normally allocate a portion of their available aircraft to defend their own high-value facilities; such infrastructure would therefore constitute an

adversary's "defensive" air posture target set. Likewise, assets critical to friendly forces would constitute an adversary's "offensive" air posture target set. These target areas are then analyzed in relation to various factors that may influence how they are attacked and from which direction. These factors may include whether the target is hard or soft, the presence of nearby air defenses, and the characteristics of surrounding terrain features. For example, some deep underground facilities may require the use of deep earth penetrators dropped from a higher altitude than would otherwise be necessary for a low-altitude attack against a soft target, or may require functional defeat by attacking the target's links to the outside world. Air defense system capabilities may drive the air attack profile to either a high, medium, or low profile. Consequently, factors such as terrain masking and potential air defense envelopes are crucial considerations in analyzing potential air attack profiles in the target area. The ultimate purpose of this type of target analysis is to determine the optimal air attack heading and profile. The attack heading can then be combined with an analysis of airfield locations and an evaluation of the terrain to determine appropriate air avenues of approach.

(2) **Airfields and Support Infrastructure.** All current and potential airfields within range of identified target areas should be identified and analyzed. These should include not only military airfields, but also civilian or abandoned airfields capable of being rapidly modified to support either offensive or defensive air operations. Additionally, terrain should be evaluated to locate potential sites for future air bases, and to determine whether or not elevation will be a limiting factor to the type of aircraft staging out of a specific airfield. Airfield analysis should include all those able to host both rotary- or fixed-wing aircraft. The analysis of current and potential military airfields should consider factors such as:

- (a) Runway length, width, weight-bearing capacity, elevation, lighting, navigation aids, and potential for expansion;
- (b) Proximity to logistic support and LOCs;
- (c) Amount of space available to park military aircraft and their requisite support infrastructure, to include materials handling equipment;
- (d) Availability of food and water;
- (e) Suitability of C2 infrastructure;
- (f) Availability, capacity, and hardness of storage facilities for petroleum, oils, and lubricants; and
- (g) HN military or civilian support capabilities.

(3) **Missile Launch Sites.** Maximum range arcs should be drawn from all known adversary ballistic and cruise missile launch sites. These should include fixed sites as well as garrison locations of mobile missile units. The terrain surrounding mobile

missile garrison locations and likely missile operating areas should be analyzed to determine possible pre-surveyed launch, hide, and reload locations. Cross-country movement analysis should be conducted to determine likely operating areas for mobile systems. Likely deployment locations should also be identified for mobile missile units accompanying forward ground forces. Possible hide and reload locations for forward-deployed mobile missiles might include forested areas with good access roads, highway underpasses, warehouses, and possibly urban areas. Friendly forces and critical resources within range of the adversary's potential launch sites should be identified. This in turn will facilitate the determination of likely adversary ballistic missile trajectories and launch azimuths.

**(4) Potential Carrier-Based Aviation and Sea-Launched Cruise Missile Locations and Operating Areas.** If the adversary has an aircraft carrier, submarine, or sea-launched cruise missile (SLCM) capability, bodies of water in the AOI should be analyzed to determine possible deployment locations. Aircraft carrier task forces normally require adequate sea room in which to maneuver and maintain security. Aircraft carriers will generally avoid confined or restrictive bodies of water along an adversary's littoral. However, they may operate in such waters if the threat level is low, if the operation requires them to, or if they can take advantage of geographic characteristics such as terrain masking. Identifying potential SLCM launch locations is more problematic, and depends largely on factors such as target location, SLCM range, and the adversary's launch platform (i.e., surface combatant vice submarine). For example, bottom composition and fathom curves need to be analyzed to determine possible submarine locations within SLCM range of potential targets.

**(5) Surface Features and Service Ceilings.** The analysis of surface features and service ceilings between the airbase and target area will facilitate the identification and evaluation of air avenues of approach. Terrain is critical to air route planning. Both man-made and natural features can represent obstacles to low-flying aircraft, especially those using a terrain corridor as an air route. Flight obstacles could include objects or features such as high tension power lines, bridges, high rise buildings, dams, towers, or bends in the terrain corridor too sharp for high performance aircraft to negotiate. Service ceilings are another aspect of the environment that are crucial to route planning. Operations at extreme altitudes (in some mountain ranges or highland plateaus) will often preclude the effective use of rotary-wing aircraft. This may be due to an inability to carry sufficient amounts of ordnance, inadequate environmental support for aircrews, or exceeding the aircraft's operational ceiling.

**(6) Air Avenues of Approach.** Air avenues of approach differ from ground avenues of approach in that the former are three-dimensional, and are often unconstrained by geographical features. Air avenues of approach consider nongeographic aspects of the environment, such as overflight restrictions, aircraft performance characteristics, counterair capabilities, early warning radar coverage, and the locations of air defense envelopes. Under certain circumstances terrain, in combination with adversary capabilities, can influence the choice of particular routes. For example, terrain corridors are usually desirable for rotary-wing aircraft, because they afford some defilade from air



defense systems located outside the corridor. Conversely, air avenues of approach in an urban environment are often restricted due to man-made obstacles (e.g., power lines, building height and the possibility of man-portable defense systems) hidden within the city. The evaluation of terrain corridors for potential use by rotary-wing aircraft as air avenues of approach must pay particular attention to the location of any natural or man-made obstacles to flight within the corridor. Depending on aircraft vulnerability to detection, terrain masking may be desirable to provide concealment from ground observation or radar acquisition. Additionally, areas along potential air avenues of approach that provide good terrain background (ground clutter) against look-down and shoot-down radar are particularly important to low-flying aircraft.

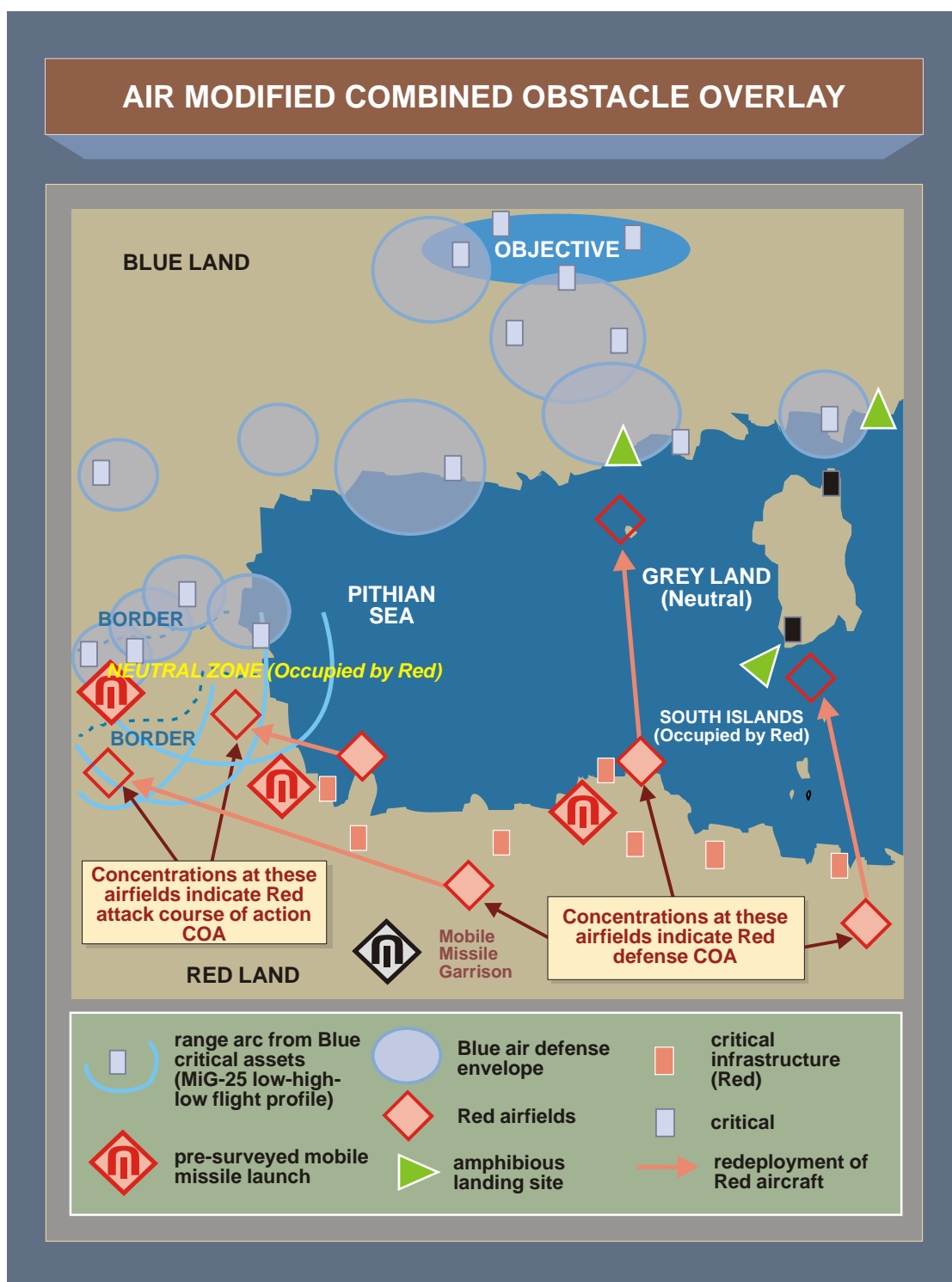
(7) **Evaluate the Impact of the Air Domain on Military Operations.** The final step in the process is to evaluate the overall impact of the air domain on adversary and friendly capabilities to conduct offensive and defensive air operations and to support broad multi-Service or joint COAs such as to attack, defend, reinforce, or retrograde. All militarily significant characteristics of the surface and air environments that may constrain or facilitate air operations should be graphically portrayed on a MCOO (see Figure II-8).

(a) **Air Operations Sustainment.** Air assets must be able to sustain a sortie rate sufficient to accomplish all the objectives of the air portion of a campaign. Critical factors in a force's ability to sustain air operations include: air crew availability, aircraft utilization rates, availability of fuel and ordnance, effectiveness of force protection measures, the capability of support infrastructure, and the capacity of LOCs between airfields and logistic support facilities. The JIPOE analyst must be prepared to address the ways in which these factors will impact on sortie rates.

(b) **Operating Altitudes and Ranges.** Air operations will utilize a wide variety of aircraft performing many types of missions, to include counterair, air interdiction, close air support, strategic attack, airlift, special operations, intelligence collection, air refueling, and combat search and rescue. In performing these missions, aircraft will have to operate at different altitudes and ranges for different periods of time. The JIPOE analyst must therefore be thoroughly familiar with terrain elevations and seasonal variations in air density in the operational area, as well as with overflight restrictions and adversary air and/or air defense capabilities and envelopes. In this way, the analyst will be able to identify and propose appropriate locations to establish assembly areas, penetration axes, and orbit points.

(c) **Mission Execution.** The JIPOE analyst should identify any environmental factors that may assist or hinder the accomplishment of an air mission. These factors may include potential sources of collateral damage; the use of camouflage, concealment, and deception in the target areas; the location of adversary air defense systems along air avenues of approach; the location of flight obstacles; and weather.





**Figure II-8. Air Modified Combined Obstacle Overlay**

(d) **Air Engagement and Ambush Areas.** Combat air patrol areas, air defense sites, and EW and passive detection system locations are greatly influenced by terrain. These assets will usually be positioned to maximize optical and radar line of sight and avoid terrain masking. The analyst should be prepared to identify those areas of

the operational environment where air defense systems and terrain features can be integrated to form optimal air engagement areas and ambush sites.

d. **The Space Domain.** Forces that have access to the space domain are afforded a wide array of options that can be used to leverage and enhance military capabilities. Every country has access to either its own satellites or to those of another country or commercial entity through the purchase of services. Thus the monitoring and tracking of friendly, hostile, and even neutral space assets is necessary for a complete understanding of the operational environment.

(1) United States Strategic Command is responsible for monitoring foreign space activity and performing all-source analysis of foreign space operations. However, the joint force JIPOE analyst also needs to be familiar with some characteristics of the space environment in order to effectively integrate space intelligence assessments into the overall JIPOE analysis and to formulate appropriate RFIs. The following environmental characteristics have the greatest potential for affecting the military use of space for both friendly and adversary forces:

(a) **Orbital Mechanics.** Earth satellites are subject to physical laws that constrain their orbits. These constraints can be used to predict satellite locations and to assess satellite functions and capabilities based on their association with various types of orbits. Factors that constrain satellite orbits include inclination and launch location, orbit type and altitude, and orbital plane and launch windows.

(b) **Propagation.** Because space has no atmosphere, electromagnetic energy essentially passes unattenuated through space. This offers special operating advantages, especially in fields such as communications and navigation.

(c) **Orbit Density and Debris.** Depending on their relative utility for civil and military applications, some orbits contain greater numbers of satellites than others. This “clustering tendency” presents a wide range of problems for space operations planners related to launch window planning, satellite positioning, and space control. A related problem to orbital density is the increasing amount of space debris in orbit.

(d) **Solar and Geomagnetic Activity.** The sun directly affects the exoatmospheric environment by radiating electromagnetic energy and atomic particles that restrict locations where space systems can operate effectively. This will impact global positioning satellite accuracy, high frequency communication, airborne communications relay, and space based reconnaissance for a period of time in a specific location.

(2) **Evaluate the Impact of the Space Domain on Military Operations.** Space systems are predictable in that they are placed into the orbits that maximize their mission capabilities. For example, high resolution weather satellites are normally placed in low-earth orbits, while communications and weather satellites that must continuously view a given area are most efficiently operated at geosynchronous altitudes. Likewise,

highly elliptical orbits that provide long dwell times over the northern hemisphere are useful for communications and other satellites. Additionally, the limited number of space launch facilities in the world, combined with predictable launch windows for specific orbital planes, facilitate the prediction of pending satellite launches. Once a satellite is tracked and its orbit determined, space operations and intelligence crews can usually predict its function and future position (assuming it does not maneuver). The path a satellite makes as it passes directly over portions of the earth can be predicted and displayed on a map as a satellite ground track. This predictability allows JIPOE analysts to warn friendly forces about upcoming gaps in friendly space system coverage or mission capabilities (such as changes in global positioning satellite accuracy), as well as upcoming windows of vulnerability to adversary space systems. Conversely, adversary space forces are able to do the same. The predicted ground tracks and “footprints” of adversary reconnaissance satellites, as well as the locations of space-related infrastructure (e.g., space launch facilities, satellite ground control stations), should be depicted on the space MCOO (see Figure II-9). The JIPOE analyst should use this overlay to identify gaps in the adversary’s space-based reconnaissance capabilities.

e. **The Information Environment.** The information environment is where humans observe, orient, decide, and act upon information, and is therefore the principal environment of decision making. This environment is pervasive to all activities worldwide, and is a common backdrop for the air, land, maritime, and space physical domains of the JFC’s operational environment. The actors in the information environment include military and civilian leaders, decision makers, individuals, and organizations. Resources include the information itself and the materials and systems employed to collect, analyze, apply, disseminate, and display information and produce information-related products such as reports, orders, and leaflets. *Cyberspace* is a global domain within the information environment consisting of the interdependent network of information technology infrastructures, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers. Within cyberspace, electronics and the electromagnetic spectrum are used to store, modify, and exchange data via networked systems. Significant characteristics of the information environment can be further evaluated within physical, informational, and cognitive dimensions (see Figure II-10).

(1) The **physical dimension** of the information environment in a specific operation is composed of the C2 systems and supporting infrastructures that enable individuals and organizations to conduct operations across the air, land, maritime, and space domains. It is also the dimension where physical platforms and the communications networks that connect them reside. This includes the means of transmission, infrastructure, technologies, groups, and populations. **Joint forces leverage these capabilities through cyberspace.** The Global Information Grid — a part of the physical dimension — is the globally interconnected, end-to-end set of information capabilities, associated processes and personnel for collecting, processing, storing, disseminating, and managing information on demand to joint forces, policy makers, and others. The physical dimension extends beyond the operational area to encompass those theater and national capabilities (such as systems, databases, centers of excellence,



subject-matter experts) that support the JFC's C2 and decision-making requirements. Cyberspace encompasses many physical dimension capabilities, but others exist outside cyberspace. Examples include important information infrastructures such as television, radio, and newsprint, even though these access cyberspace to support their products. Likewise, individuals are non-cyberspace transmitters and receivers of information.

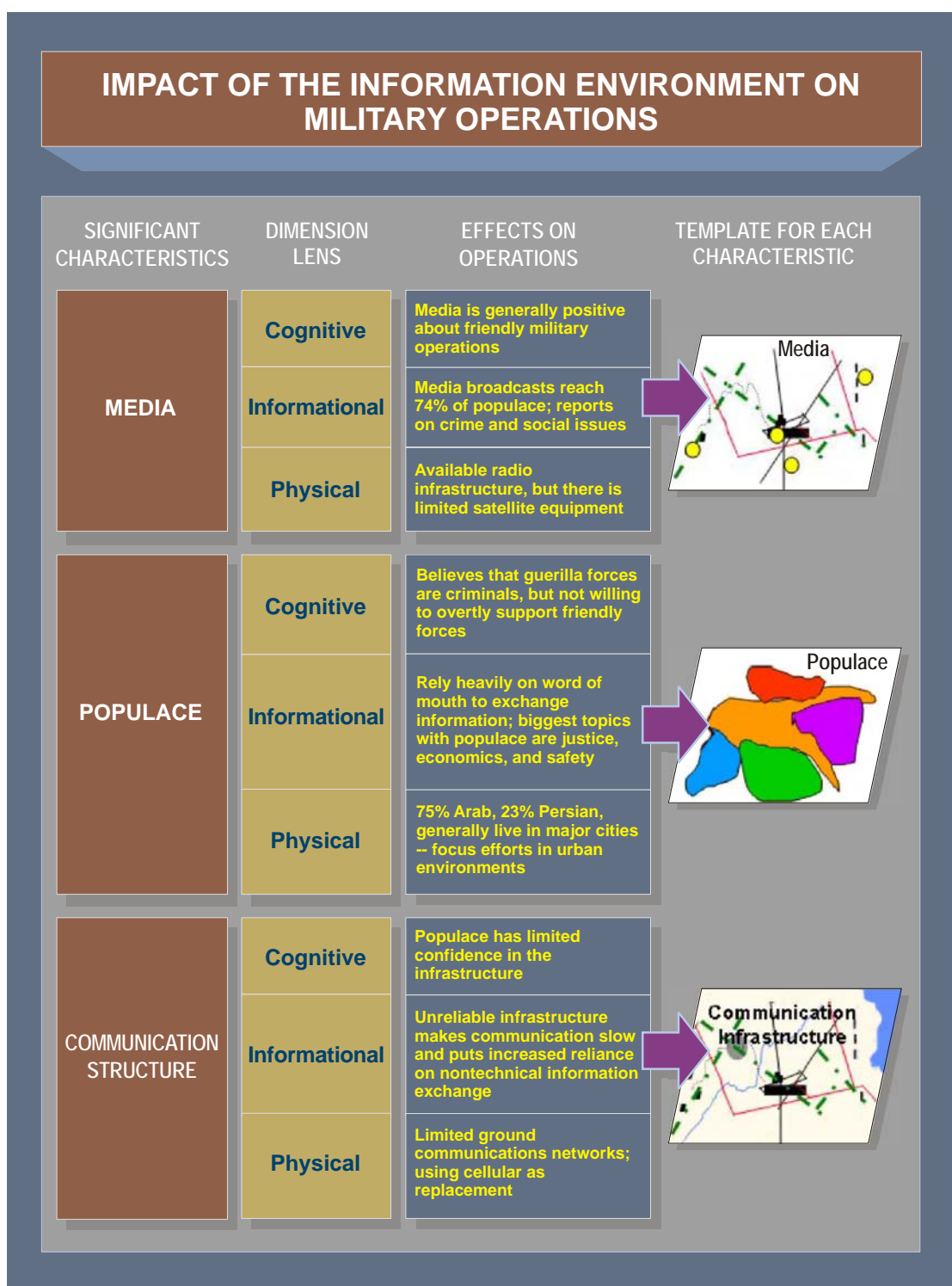


Figure II-10. Impact of the Information Environment on Military Operations

(a) **Computer Hardware.** Computer hardware consists of electronic circuitry that is extremely vulnerable to high temperatures, as well as to electrical power fluctuations and interruptions. Power surges and electromagnetic pulses, either man-made or resulting from natural causes (such as lightning strikes), can severely degrade computer operations. Hardware is also vulnerable to the availability and source of supply

of replacement parts and computer chips. Additionally, hardware malfunctions may be induced as a result of mistakes (either intentional or unintentional) made during the manufacturing and assembly of the computer.

(b) **Networks.** Information system networks rely on telecommunications links and are vulnerable to the same types of attack an adversary might conduct against any C2 system, such as jamming, physical destruction, and intrusion. The vulnerability of computer networks to these types of attack is increasing as more systems are linked with, and through, civilian telecommunications systems. Without adequate safeguards, network links provide a gateway through which an adversary can gain unauthorized access to information systems and databases. Depending on the characteristics of the network, some systems may be able to be accessed from anywhere in the world, and (more importantly for plausible denial) through anywhere in the world. For example, an adversary might access a system in another country through telecommunications channeled through a third country.

*“It is essential to have an all-conquering offensive technology and to develop software and technology for Net offensives so as to be able to launch attacks and countermeasures on the Net, including information-paralyzing software, information-blocking software, and information-deception software... Modern high-tech warfare cannot win without the Net, nor can it be won just on the Net. In the future there must be a coordinated land, sea, air, space, electronic, and Net warfare... A ‘Net force’ is very likely to become another military branch following the army, air force, and navy, and it will shoulder the formidable task of protecting Net sovereignty and engaging in Net warfare.”*

**SOURCE: “Bringing Internet Warfare Into the Military System  
is of Equal Significance with Land, Sea, and Air Power,”  
*Liberation Army Daily*  
Beijing, Nov 11, 1999**

(2) **The Informational Dimension.** The informational dimension links the physical and cognitive dimensions. The joint force uses cyberspace capabilities, cyberspace operations, and noncyberspace ways and means to collect, process, store, disseminate, display, and protect information and related products. The informational dimension focuses on the content and flow of information, and it is in this dimension that the commander communicates intent and commands and controls military forces. The relative vulnerability of various aspects of the informational dimension (whether due to poor physical security, improper operator training, or lack of safeguards) combined with the level of sophistication of an adversary’s CNA capabilities, may help analysts determine an adversary’s potential method of attack.

(a) **Computer Software.** Computer systems rely on software ranging from operating systems to programs designed to manipulate highly complex data. This

relationship makes information systems extremely vulnerable to infection by computer viruses (programs that are written in a way that allows them to copy themselves into other programs to cause malicious destruction of files or interruptions of service). Viruses can enter computer systems through a variety of means, such as removable memory storage devices, documents in word processors with advanced macro languages, binary programs or documents transferred through electronic mail, as well as commercial and government off-the-shelf software. Barriers to viral attack include frequent antivirus scans, training operators to recognize the symptoms of infection, and securing the network against the downloading of potentially infected software.

(b) **Data.** Information output from automated systems is only as accurate as the data originally entered into those systems. This data is subject to attack either before or after it is entered into an automated system. For example, one country may be able to manipulate another country's intelligence analysis by waging a successful camouflage, concealment, and deception effort. Thus an adversary's campaign of deception may result in the entry of erroneous information into another country's automated databases. An attack against data already residing in automated systems presents a more complex problem, usually requiring access to the information system. However, if system access can be gained, the payoff is usually greater in that it allows an adversary several different options (to read data, change data, gather data, or erase data).

(c) **Procedures.** Information system procedures are established to ensure that various data maintenance programs are run at specific times and in a rational sequence, that systems access is limited only to authorized personnel, and that computer hardware is physically secured. Since by their very nature procedures establish a set of predictable events in a predictable sequence, it may be possible to discern and exploit vulnerabilities in an opponent's established schedule.

(d) **Human Operators.** Human operators such as systems maintenance personnel, data entry specialists, programmers, and information system users can provide a potential means of access to all the other components of cyberspace. Therefore, an adversary's recruitment of personnel with access to friendly information systems can be potentially catastrophic. Additionally, system malfunctions may result from inadvertent human error vice deliberate sabotage. The complexity of modern information systems is such that it may be difficult to discern an intentional vice unintentional error. The vulnerability of a system to these types of human attack should be analyzed by assessing the organization's level of personnel security and the degree of operator proficiency.

(3) **The Cognitive Dimension.** The cognitive dimension encompasses the minds of those who transmit, receive, and respond to or act on information. In this dimension, people think, perceive, visualize, understand, and decide. These activities may be affected by a commander's psychological characteristics, personal motivations, and training. Factors such as leadership, morale, unit cohesion, emotion, state of mind, level of training, experience, situational awareness, as well as public opinion, perceptions, media, public information, and rumors may also affect cognition. Particularly in operations characteristic of irregular warfare (such as counterinsurgency), operations can succeed or fail based on how adept the commander and staff are at



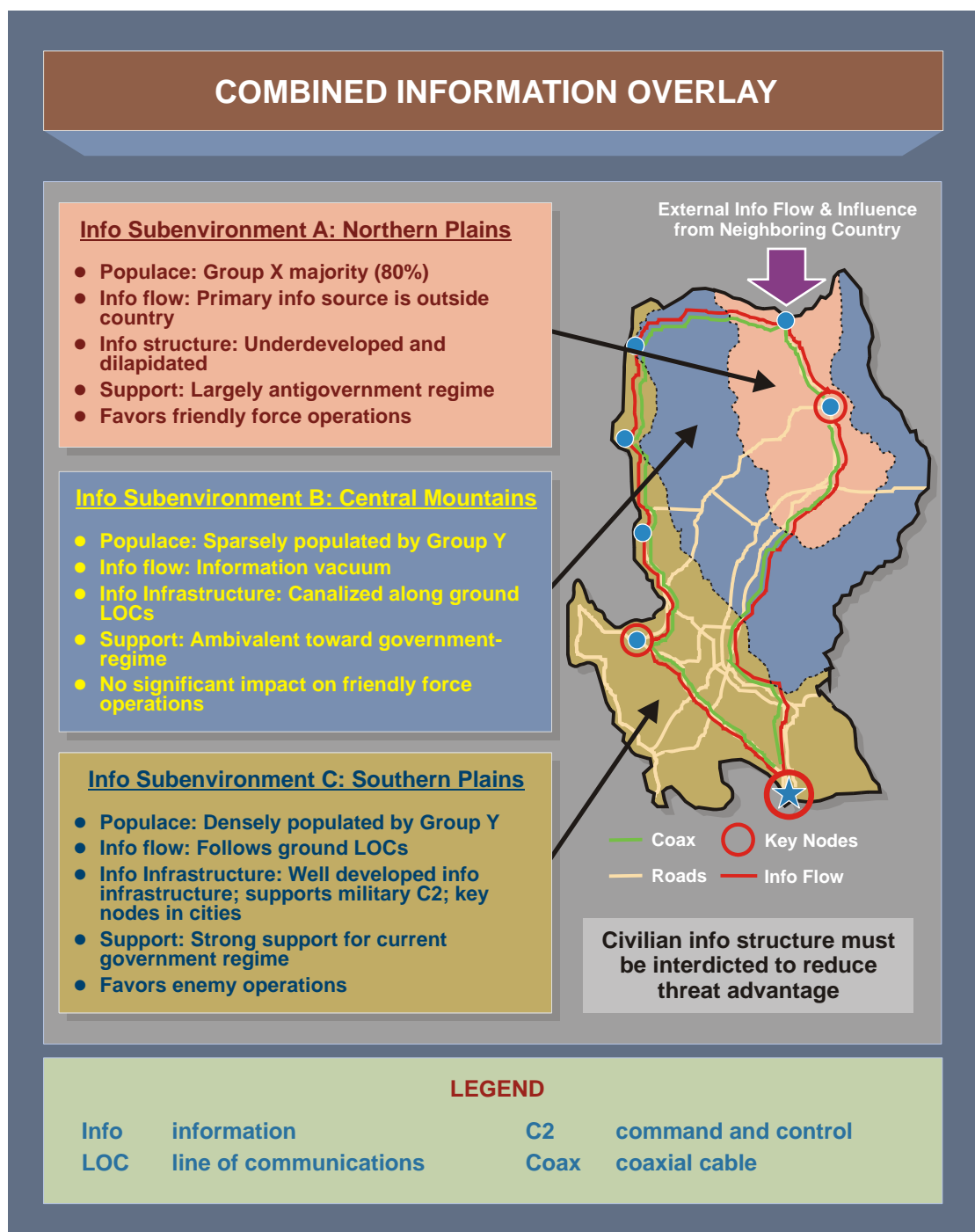
understanding and operating in the cognitive dimension with respect to the target population. The analysis of the cognitive dimension is a two-step process that: (1) identifies and assesses all human characteristics that may have an impact on the behavior of the populace as a whole, the military rank and file, and senior military and civil leaders; and (2) evaluates the influence these human characteristics have on military operations.

(a) **The Populace.** This portion of the JIPOE analysis should consider both civilian and military populations, especially in countries where military institutions may have an adversarial or oppressive relationship with all or portions of the civil populace. The degree to which the attitudes, beliefs, and backgrounds of the military rank and file either reflect or conflict with core values held by the populace as a whole and/or the leadership is extremely important to this analysis. Additional significant factors to consider include population patterns, living conditions, ethnic conflicts and rivalries, languages and dialects, cultural and class distinctions, political attitudes, religious beliefs, education levels, and any existing or potential refugee situations.

(b) **The Leadership.** Biographical background data on key adversary military and political leaders, both ruling and opposition, should be compiled. This data should include information regarding the leader's ethnic, class, and family background; education, experience, and training; and core beliefs and values. Character trait data such as a leader's core beliefs and values, perceptual biases, and decision making style should be combined with a historical track record of that leader's past decisions. Such information may be used to construct a psychological profile for the leader that may assist in predicting how that leader may respond in a given situation. Depending on the amount of data available, it may be possible to construct a psychological profile for the leadership as a whole, as well as for specific individuals.

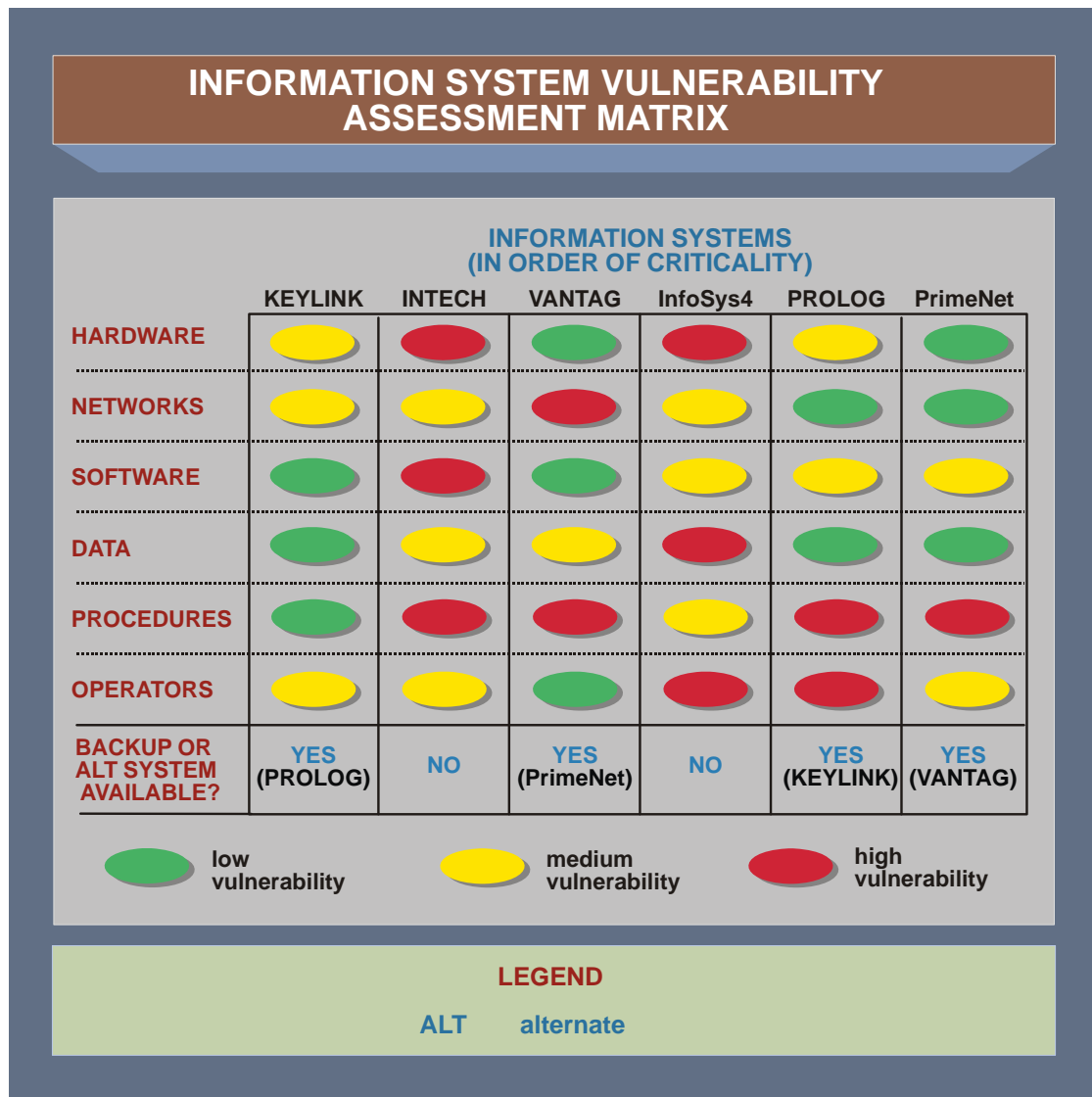
(4) **Evaluate the Impact of the Information Environment on Military Operations.** The impact of the information environment should be analyzed to consider how significant characteristics affect friendly, neutral, and adversary capabilities and broad COAs. Significant characteristics, further analyzed within the physical, informational, and cognitive dimensions, can be graphically represented on a combined information overlay (Figure II-11). The analyst can use this overlay to identify strengths and/or vulnerabilities of the information environment that can be exploited by friendly or adversary forces.

(a) **Impact of Cyberspace.** The impact of cyberspace should be evaluated by identifying and prioritizing those information systems and networks deemed most critical to the planning and execution of military operations. Depending on the criticality of the system, the effects of data loss or even a short down time can result in a lingering ripple effect on military operations that may last days, weeks, or months. The relative vulnerability of each critical system should also be assessed: first, by evaluating the strengths and weaknesses of each of its cyberspace aspects, and second by identifying any backup systems, "work arounds," or redundant links. Those systems that are assessed to be most important and most vulnerable should be identified as likely targets



**Figure II-11. Combined Information Overlay**

for CNA, EW, or physical attack. This analysis can be graphically portrayed in the form of an information system vulnerability assessment matrix. Figure II-12 is an example of a matrix that assesses the vulnerability of several notional information systems listed in order to determine their overall vulnerability. In the example shown, the INTECH system is more vulnerable to CNA than the KEYLINK system. The overall vulnerability of a network/system, however, doesn't necessarily determine the criticality of the system



**Figure II-12. Information System Vulnerability Assessment Matrix**

or likelihood of an attempted attack. Risk to operations is calculated by multiplying the vulnerability of a network/system, the threat to the system, and the overall impact (criticality) of the network/system.

(b) **Impact of the Cognitive Dimension.** The characteristics of the human environment should be evaluated to determine the probable state of morale in both the civil and military population. Morale is a significant factor not only in assessing the overall capability of a military force, but also in evaluating the extent to which the civil populace will support military operations. The degree of regime loyalty should be assessed not only for the populace but also, if possible, for individual leaders. Depending on the situation, factors such as ethnic, religious, political, or class differences may be exploitable for PSYOP purposes. Psychological profiles on military and political leaders may facilitate understanding an adversary's behavior, evaluating an adversary's vulnerability to deception, and assessing the relative probability of an adversary's adopting various COAs.

f. **Other Relevant Aspects of the Operational Environment.** Other aspects include all those characteristics of the operational environment that could affect friendly or adversary COAs that fall outside the parameters of the categories previously discussed. The following are some additional aspects that should be addressed when evaluating the operational environment:

(1) **The Electromagnetic Spectrum.** The electromagnetic aspect of the operational environment includes all militarily significant portions of the electromagnetic spectrum, to include those frequencies associated with radio, radar, laser, electro-optic, and infrared equipment. It is a combination of the civil electromagnetic infrastructure; natural phenomena; and adversary, friendly, and neutral electromagnetic OB. The electromagnetic spectrum provides the operating medium for communications; electro-optic, radar, and infrared imagery; signals intelligence; measurement and signature intelligence; and EW operations. Use of the electromagnetic spectrum for military or civilian purposes is constrained by a variety of factors, ranging from international agreements on frequency usage to the physical characteristics of electromagnetic waves. In order to evaluate how the electromagnetic spectrum will affect military operations in a specific geographic area, the JIPOE analyst should consider such factors as the following:

(a) **Military Use of the Infrared Band.** Depending on their temperatures, objects emit varying amounts of electromagnetic energy in the infrared band. Infrared sensors are therefore able to distinguish objects based on their relative temperatures, and have numerous military applications such as night vision devices, target acquisition, missile launch detection, and intelligence collection. When used with other ISR assets, infrared sensors can be valuable tools for both adversary and friendly forces. The JIPOE analyst should evaluate the capabilities and limitations of various infrared sensors to determine friendly and adversary vulnerabilities and to support deception planning efforts.

(b) **Military Use of Multispectral and Hyperspectral Imagery.** Multispectral imagery (MSI) provides a level of information greater than traditional panchromatic imagery by collecting reflected or emitted electromagnetic energy simultaneously within approximately ten spectral bands. Hyperspectral imagery (HSI) provides even greater capabilities by simultaneously collecting energy within 20-299 discrete spectral bands. MSI and HSI permit analysis of spectral profiles to identify militarily significant characteristics of the imaged surface, particularly camouflage, concealment, and deception efforts. The JIPOE analyst should be familiar with both friendly and adversary MSI and HSI capabilities and the potential application of this technology to support military operations.

(c) **Radio Wave Directionality.** A radio wave normally travels along a line of sight from a transmitter, but may change direction as a result of reflection, refraction, or diffraction. Reflection of radio waves makes it possible to extend the range of communications equipment by bouncing skywaves off the ionosphere, and for radar to detect and locate objects by receiving reflected energy. Radio waves that are refracted (bent as they pass through the atmosphere) may become trapped in a tropospheric duct

and travel for several thousand miles. Since the amount of refraction increases as the radio frequency increases, tropospheric refraction is most effective at frequencies greater than 50 megahertz. Conversely, a radio wave's diffraction (ability to bend around a solid object) is greater at lower frequencies. In certain cases, by using high power and low frequencies, it is possible for radio waves to circle the Earth by diffraction.

(d) **Radio Wave Attenuation.** Surface characteristics greatly affect the quality of communications and the communication distance obtainable using ground waves (radio waves propagated parallel to the Earth's surface). The surface over which the ground wave travels must have good conductive characteristics in order to prevent the wave from attenuating so much that it becomes unusable for communications. For example, seawater is a relatively good conductor, while jungle terrain may weaken the ground wave to the point that it is unusable for communications. The amount of water vapor or precipitation present in the air is an additional factor capable of degrading wave propagation. Additional power sources or relay sites may be required to boost the signal strength of ground waves in areas with poor surface or weather characteristics. Areas where surface characteristics may pose significant wave attenuation problems should be identified and displayed on a MCOO for the electromagnetic environment (see Figure II-13).

(e) **Skip Zones and Skip Distances.** Sky waves are bounced off the ionosphere to extend communications up to 2,500 miles per "hop." A skip zone is essentially a communications "deadspace" between the transmitter and point where the sky wave returns to Earth. The size of the skip zone is related to the frequency of the sky wave and the constantly changing characteristics of the ionosphere. In general, lower frequencies bounce off the ionosphere at lower altitudes than higher frequencies, and therefore return to earth a shorter distance from the transmitter. Factors that influence the ionosphere include the time of day, the season, solar flares, magnetic storms, and nuclear detonations.

(f) **Interference.** Radio interference can result from natural or man-made causes. For example, in the tropics where thunderstorms are prevalent, low frequency ground wave communications may be unreliable, requiring greater reliance on the higher frequencies of sky waves. Conversely, in the polar regions where thunderstorms are rare, sky waves are seriously disrupted by magnetic disturbances, and military operations may rely more on low-frequency ground wave communications. Man-made interference may be intentional, as in the case of jamming, or the unintentional result of frequency clustering. The JIPOE analyst should construct an interference evaluation chart (see Figure II-14) by identifying all potential sources of interference and plotting their frequency ranges along the electromagnetic spectrum. Examples of potential sources of interference may include friendly, adversary, and neutral military and civilian emitters, as well as any weather or geomagnetic disturbances.

(g) **Evaluate the Impact of the Electromagnetic Environment on Military Operations.** The evaluation of the electromagnetic environment is accomplished by the joint frequency management office and joint spectrum management element of the J-6, in accordance with Chairman of the Joint Chiefs of Staff Manual



Figure II-13. Electromagnetic Modified Combined Obstacle Overlay

(CJCSM) 3320.01B, *Joint Operations in the Electromagnetic Battlespace*. The JIPOE analyst must work closely with J-6 personnel to ensure that this analysis is fully integrated into the overall JIPOE effort and is based on the most up-to-date adversary and third party information. Depending on actual surface and atmospheric conditions, the

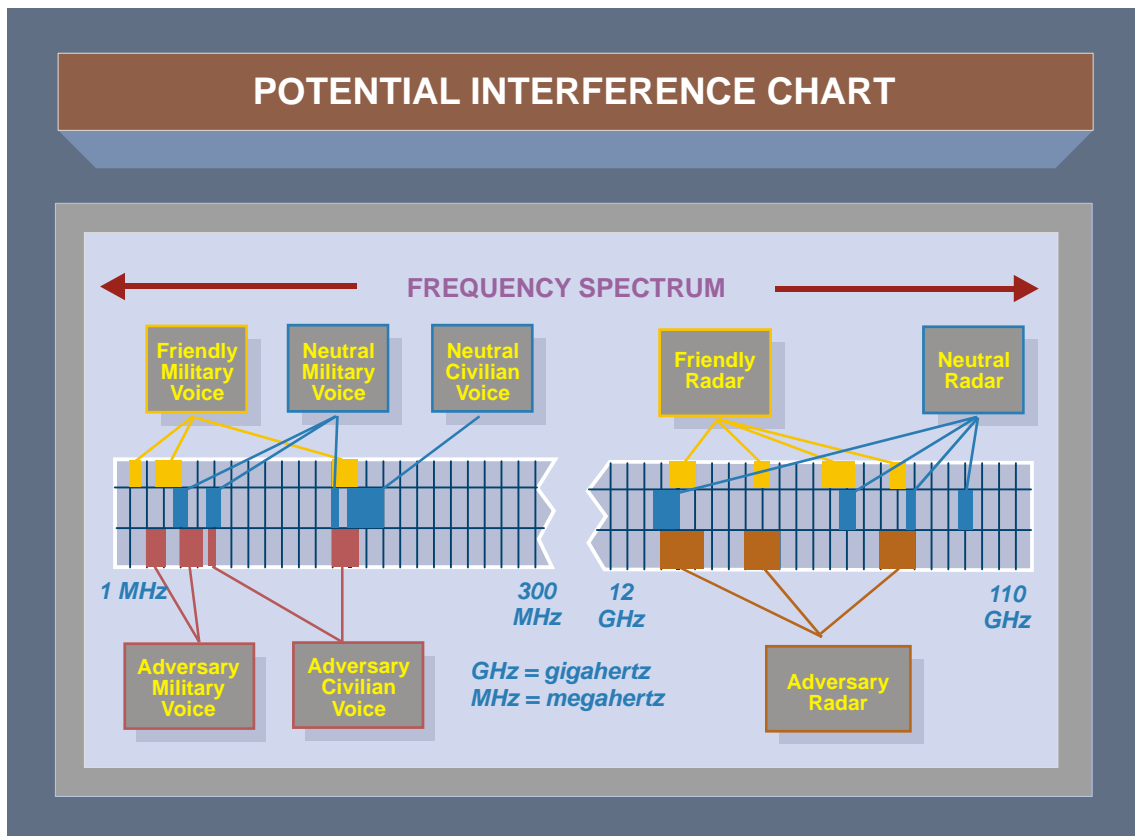


Figure II-14. Potential Interference Chart

electromagnetic environment will, to a greater or lesser degree, facilitate activities such as the C2 of military forces, EW operations, and intelligence collection. The effects of potential interference, skip zones, radio deadspace, and radio wave attenuation on specific types of military operations should be evaluated. For example, geographic areas or periods of weather that degrade radio communications can hinder an attacking force due to the necessity of displacing transmitters. Conversely, a defending force may be able to shift to alternate communications such as landlines.

(2) **Weather and Climate.** Weather is the state of the atmosphere regarding wind, temperature, precipitation, moisture, barometric pressure, and cloudiness. Climate is the composite or generally prevailing weather conditions of a region, averaged over a number of years. Initial studies of climatic effects may be prepared using available climatological data and/or seasonal outlooks requested from the DOD climate centers. These climate-based products are updated with outlooks and forecasts as more precise information is received concerning the actual weather conditions expected. METOC conditions affect the operational environment in several ways: the atmospheric and/or oceanographic environments can interact with, and thereby modify, the characteristics of each physical domain; or METOC can have a direct effect on military operations across all domains. This section will concentrate on the direct effect of weather on military operations, personnel, and equipment. The military aspects of weather are visibility, winds, precipitation, cloud cover, and temperature and humidity. The joint force METOC officer is the source for weather information, and assists the joint force staff in



determining the effects of METOC on adversary and friendly military operations. The analysis of the effects of weather on military operations is a two-step process in which: each military aspect of weather is analyzed; and the effects of weather on military operations are evaluated.

*"Some soldier once said that weather is always neutral. Nothing could be more untrue. Bad weather is obviously the enemy of the side that seeks to launch projects requiring good weather, or of the side possessing great assets, such as strong air forces, which depend upon good weather for effective operations."*

**Dwight D. Eisenhower,**  
***Crusade in Europe, 1948***

(a) **Visibility.** Visibility is largely a result of various weather conditions. For example, atmospheric obstructions to transmission of the various spectra affect the atmospheric path of those wavelengths. Moisture in the form of fog or clouds affects visible light wavelengths; while high absolute humidity (another measure of moisture) degrades infrared wavelength transmissivity and sensors that operate in the infrared spectrum. Atmospheric aerosols (particulates such as smoke, dust, or haze) can also affect transmissivity: offensive smoke operations, using specifically sized particulates, are designed to degrade adversary sensors. Obviously, target visibility can be affected by available light, but ambient light is a function of atmospheric transmissivity and obstructions (clouds shielding moonlight) as well as terrain obstructions (mountains creating shadows to the rising/setting moon) or causing an earlier/later onset of twilight, depending on the physical environment's geometry. Other major factors include the rising, setting, and phases of the moon (thin high cirrus cloud cover actually enhances nighttime ambient light), as well as the times associated with the beginning of morning nautical/civil twilight, sunrise, sunset, and end of evening nautical/civil twilight. Low visibility is beneficial to offensive and retrograde ground operations. In the offense, it conceals the concentration and movement of military forces, thus enhancing the possibility of achieving surprise. Conversely, low visibility hinders the defense because cohesion and control become difficult to maintain, and reconnaissance, surveillance, and target acquisition are degraded. Air operations are typically adversely affected by poor visibility. The exceptions to this are those missions that are not dependent upon visual references.

(b) **Winds.** Winds of sufficient speed can reduce the combat effectiveness of a force downwind as the result of blowing dust, smoke, sand, or precipitation. The upwind force usually has better visibility. CBRN operations also usually favor the upwind force. Strong winds and wind turbulence - especially around terrain or other obstructions such as caused by strong winds in an urban environment - can limit aircraft performance as well as airborne and theater missile force operations. The evaluation of weather in support of air operations requires information on the wind at the surface as well as at varying altitudes. High winds near the ground increase turbulence, may inhibit aircraft maneuvering, and can prevent air mobility forces from conducting airdrop or

landing operations. High winds at greater altitudes can increase or reduce aircraft fuel consumption, potentially limiting aircraft range or loiter time. Varying wind directions and speeds in different layers between the surface and aircraft altitude can greatly affect the trajectories of nonguided munitions. Wind-blown sand, dust, rain, or snow can reduce the effectiveness of radars and communications systems. Strong winds can also hamper the efficiency of directional antenna systems by inducing antenna wobble. On the oceans, winds create swells and waves that can become significant hazards to operations and to logistic efforts. Furthermore, storms (e.g., hurricanes, typhoons, and intense winter storms) affecting ports/harbors and airbases can have disruptive effects on operations by forcing ships and aircraft to sortie to avoid the direct effect of the storm. Surface currents, which can vary significantly, have significant effects on littoral operations.

(c) **Precipitation.** Precipitation affects visibility and the functioning of many infrared and electro-optical sensors, radar, and communications systems, and can reduce the quality of supplies in storage. Heavy rain causes flash flooding in mountainous terrain and generalized flooding if over broad areas for extended times; effects on surface transportation can be significant. When rain falls into snowpack, it hastens melting and avalanche/flooding potential. Heavy snow cover can reduce the efficiency of many communications systems as well as degrade the accuracy and effects of many types of munitions. Freezing rain and accumulating ice causes significant impacts on surface transportation, including roads and maritime/port operations, and severely affects aircraft operations both in flight and on the ground. Depending on the commander's mission focus, flooding rains (or long-term lack of rain) in agricultural areas can be a significant factor in CMO. Where a commander is responsible for city infrastructure functions, rain and flooding can present serious challenges in water treatment/sanitation and resulting health/medical issues.

(d) **Cloud Cover.** Heavy cloud cover can degrade the effectiveness of many target acquisition and surveillance systems by concealing military forces and by reducing the solar heating of some targets. Cloud cover can therefore reduce the effectiveness of infrared-guided munitions. Low ceilings can prevent aircraft from taking off, landing, conducting low-level missions, employing weapons, or conducting airdrops.

(e) **Temperature and Humidity.** Extremes of temperature and humidity have debilitating effects on personnel and reduce equipment capabilities and the effectiveness of chemical and biological weapons. For example, high surface temperatures increase the rate of evaporation of chemical weapons. Humidity increases the effectiveness of mustard and nerve agents; wet pathogens decay rapidly in lower humidity, whereas dry pathogens decay rapidly in very high humidity. Additionally, temperature/thermal "crossover," when target and background temperatures are nearly equal, degrade the use of thermal target acquisition systems. The length of crossover time depends on air temperature, background characteristics such as soil and vegetation types or building construction and geometry to the sun, amount of cloud cover, and other factors. High humidity also affects infrared transmissivity, degrading acquisition range. Other examples of temperature effects include degrading airlift capability at high altitude

(decreased density altitude); and limiting capability of military working dogs because of near-surface atmospheric instability which causes the animal to lose scents. Variations in temperature and humidity in the vertical dimension, i.e., through the lowest several thousand feet of the atmosphere, affect electromagnetic propagation and can degrade radar signals, creating gaps in vertical coverage.

(f) Evaluate the Impact of Weather on Military Operations. Depending on actual weather conditions, each of the aspects of weather discussed above will have an impact, for better or worse, on various types of military operations, weapons systems, and personnel. Critical values should be established for each weather aspect in order to define the thresholds at which deteriorating weather conditions can be expected to have favorable, marginal, or unfavorable effects on specific types of operations and equipment. For example, it may be determined that visibilities less than one mile are unfavorable to airborne operations, temperatures of 95 to 110 degrees Fahrenheit marginally degrade offensive ground operations, or ceilings less than 200 feet may prevent air operations. An evaluation of the overall effects of forecasted weather conditions on specific types of operations is constructed by combining the analyses for each weather aspect. The effects of weather on military operations can be summarized in a matrix (see Figure II-15).

(3) **Time.** Time is a significant consideration in military operations. Analyzing it as an aspect of the operational environment focuses on how an operation's duration might help or hinder each side. This has implications at every planning level.

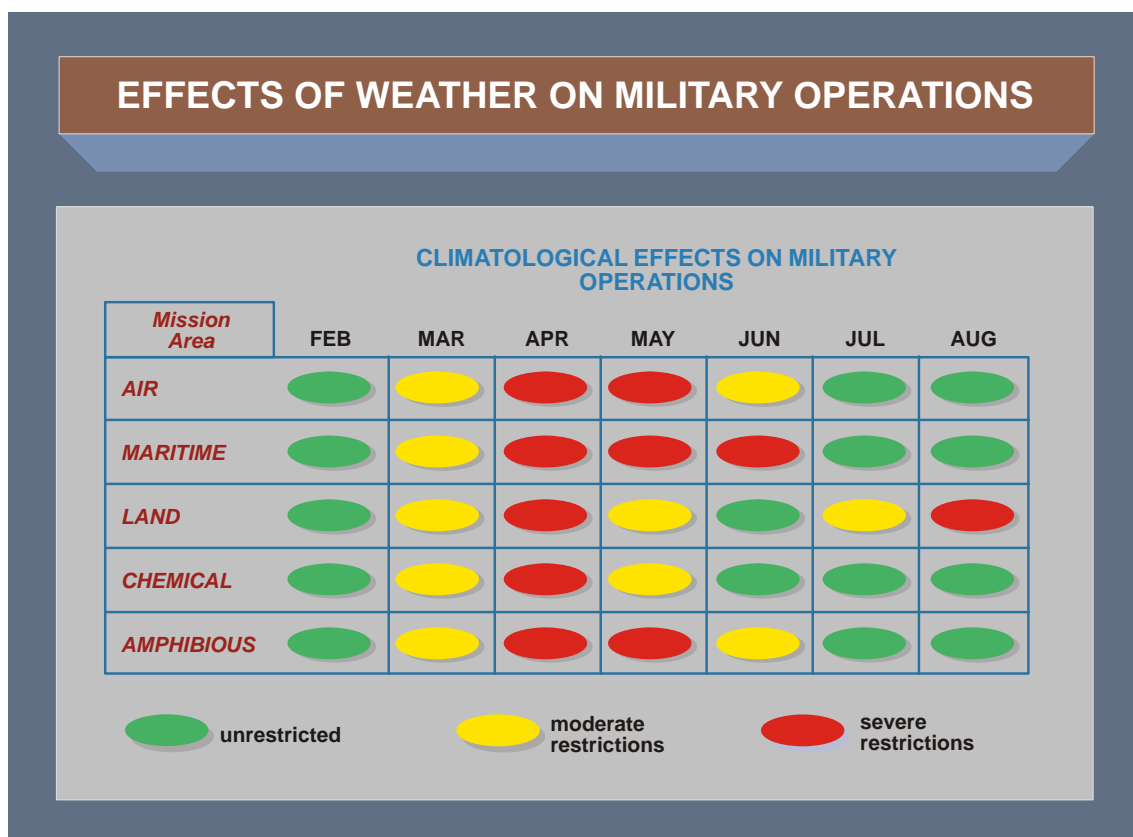


Figure II-15. Effects of Weather on Military Operations

(a) The decision and reaction time of an adversary is a crucial factor and will directly impact the resources an adversary can bring to bear in a given situation. For example, a friendly operation, if planned and executed relatively quickly, may constrain the adversary's ability to reinforce or redeploy military units in time to counter the operation. In this scenario, the adversary's potential COAs would be considerably more limited than if the same operation was preceded by a lengthy period of friendly preparations.

(b) Adversaries with limited military capability usually view protracted conflict as advantageous to them. They avoid battles and only engage when conditions are overwhelmingly in their favor. This is a strategy of exhaustion. Such a strategy dominated the American Revolution and remains effective today. The adversary concentrates on surviving and inflicting friendly and civilian casualties over time. Although the military balance may not change, this creates opportunities to affect the way domestic and international audiences view the conflict. Conversely, an adversary may attempt to mass effects and achieve decisive results in a short period.

(c) The duration and timing of operations affects people's perceptions of operational and strategic effectiveness—both in the operational area and domestically. An operation's duration may affect operational flexibility; popular support for protracted military operations may diminish if results are not evident. Operation and campaign plans that commit joint forces earlier than anticipated and that enable rapid progress toward the strategic end state use time to the advantage of joint forces. Time is both an operational planning factor and a tool to manipulate tactical and strategic advantages.

(d) Adversaries seek to control the tempo and initiative by inflicting friendly casualties and conducting propaganda operations to influence US domestic politics and relationships with multinational partners. Joint forces must actively engage in the information environment to counter such actions. In operations predominated by stability tasks, long-term objectives and relationships are critical to operational and mission success.

(e) The perception and experience of time are among the most central aspects of how groups function and interact. When people experience time differently, tremendous communication and relationship problems typically emerge. Cultural awareness includes sensitivity to how cultures in the operational area perceive time.

(4) **Sociocultural Factors and Country/Group Characteristics.** The sociocultural factors and characteristics of an adversary nation or group should be developed through the integration and analysis of the aspects listed below. Because the relevance of sociocultural factors and country/group characteristics will depend upon the specific situation associated with each mission, there can be no definitive listing of all characteristics appropriate under all circumstances. For example, some of the characteristics that may be considered significant during a sustained humanitarian relief operation may receive slightly less emphasis during combat operations against a conventional adversary. The analysis of an adversary's sociocultural factors will provide

*"It's not only about how fast you can make something fly or how fast you can find a target – it's putting all of the pieces together in an hour. That's the challenge. Technology can find things, get something that far, that quickly – technology can make it precise; but how do you put it all together inside the decision timelines of your adversary? That is at the heart of the issue in the new world with which we are now dealing. It is the decision timelines of the adversaries that we must beat; if we can stay inside of those timelines, we have a reasonable chance of outthinking, outsmarting, and outmaneuvering them."*

**General James E. Cartwright, US Marine Corps  
Warfighter Perspective on Integration of  
Strategy, Analysis, and Technology, 2007**

significant indications regarding the circumstances (ideals, goals, territory) that may cause that country to resort to the use of military force or to exercise other policy options. For example, some nations may be willing to use military force to protect international principles such as freedom of navigation, while others may fight only to protect their own national borders. Sociocultural factors and characteristics can provide important clues as to where a nation may use military force and to what degree. For example, a country will probably make an all-out effort to defend areas it deems critical, while other less crucial portions of its territory might be used to trade space for time. The following variables are examples of the types of sociocultural factors and country characteristics that should be considered by the JIPOE analyst (a more extensive discussion of sociocultural factors is contained in Chapter IV, "Special Considerations"):

(a) **Political and Military Limitations.** These may include but are not limited to: ROE; establishment and location of exclusion zones and no-fly zones; maritime defense zones; territorial waters; excessive maritime claims; and air defense identification zones. Caution should be used when analyzing the impact of military limitations that do not impose physical constraints (such as man-made obstacles), and could therefore be highly transitory.

(b) **Environmental and Health Hazards.** These may include but are not limited to the presence of communicable diseases; toxic industrial chemical threats, locations of epidemics; methods of disease transmission; location, type and extent of environmental pollution (radiation, oil spills, contamination of drinking water).

(c) **History.** Considerations may include but are not limited to past wars and military conflicts; territorial claims and disputes; ethnic or social strife.

(d) **Infrastructure.** Considerations may include but are not limited to sources of potable water; transportation means and systems (road and rail networks, canals, and waterways); communications nodes; power production facilities and transmission grids.

(e) **Industry.** Considerations may include but are not limited to bulk fuel storage and transport systems; natural resources; industrial centers; scientific and technological capabilities; chemical and nuclear facilities.

(f) **Agriculture.** Considerations may include but are not limited to land use patterns; major crops; planting and harvesting seasons; land ownership; food distribution system.

(g) **Economics.** Considerations may include but are not limited to economic system; currency; banking system; rate of inflation; key commercial areas, strength of trade unions.

(h) **Politics.** Considerations may include but are not limited to local and regional governments; international relations; foreign alliances; unofficial power centers (gangs, cartels, multinational organizations, and militias); political or ethnic grievances and affiliations.

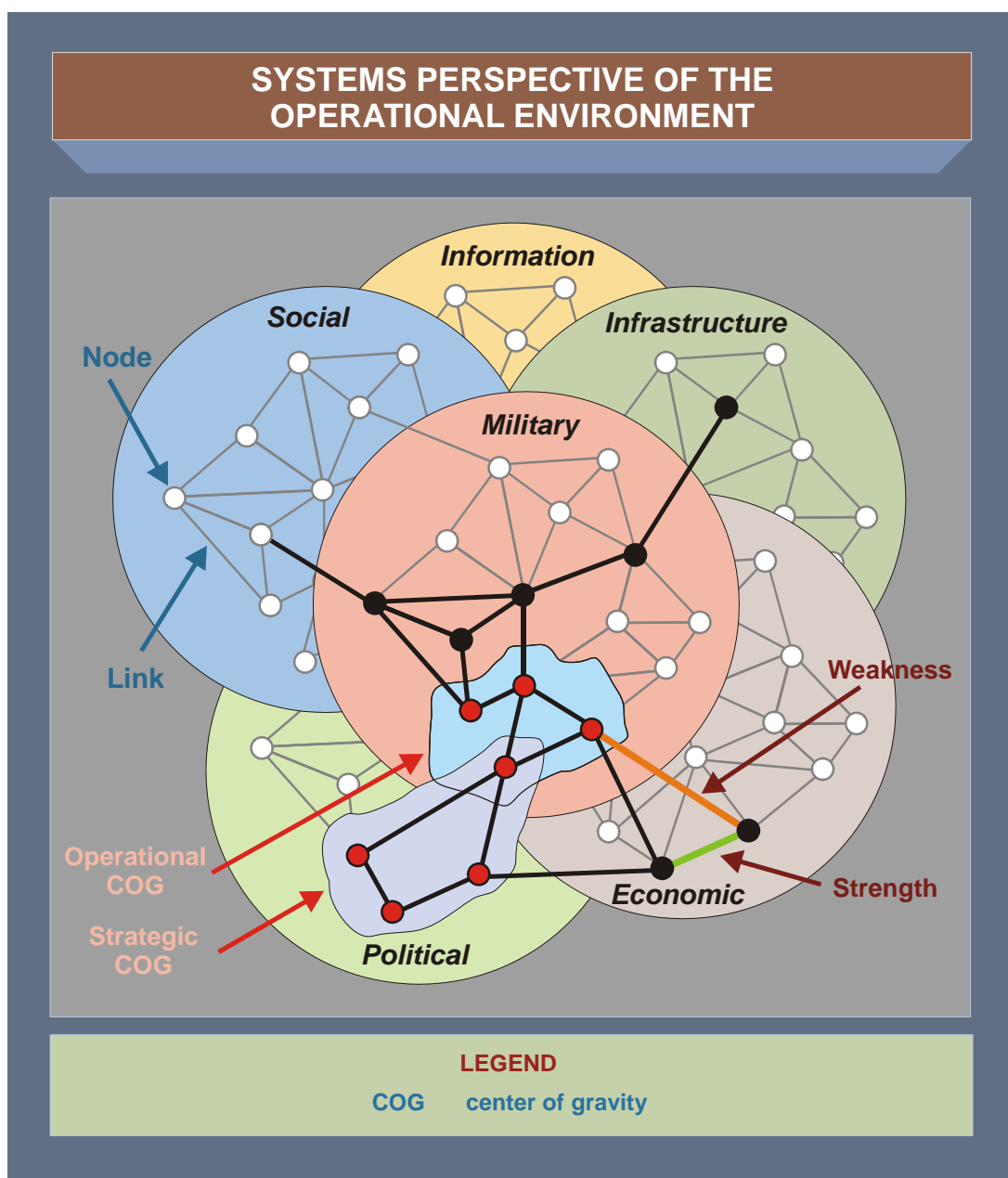
(i) **Religion.** Considerations may include but are not limited to geographic or regional patterns of religious affiliation; past and present religious conflicts among population groups; religious peculiarities and sensitivities; relationship of religion to other sources of social affiliation (e.g., ethnicity, economic class, political ideology, family clans, sects, tribes).

(j) **Evaluate the Impact of Cultural and Country Characteristics on Military Operations.** The analysis of cultural and country characteristics must include an evaluation of the effect these characteristics have on friendly and adversary COAs. Cultural factors play a significant role at the operational and strategic levels, and may be vitally important at the tactical level, especially during crisis response and limited contingency operations.

## 12. Developing a Systems Perspective of the Operational Environment

a. **Overview.** An understanding of the operational environment's systems and their interaction can help the JFC and staff visualize and describe how military actions can affect other agency and coalition partners as well as how those partners' actions can affect the JFC's operations. Visualizing and describing the interaction of PMESII systems and subsystems can facilitate the JFC's collaboration with counterparts from other agencies and organizations and help influence actions that are beyond the JFC's directive authority. The development of a systems perspective of the operational environment typically will require cross-functional participation by other joint force staff elements and collaboration with various intelligence organizations, USG agencies, and nongovernmental centers of excellence. The J-2 must consider the best way to manage this cross-functional effort. Organizations such as the JIPOE coordination cell, DIOCC forward element, and JTF JIOC (when formed), are particularly useful in coordinating and obtaining external joint and national-level support for the development and maintenance of a comprehensive systems perspective. As Figure II-16 depicts, this perspective helps the JFC and staff visualize potential or actual strengths, weaknesses, key nodes, COGs, and other factors that affect the development and analysis of COAs and eventual approval of a CONOPS.





**Figure II-16. Systems Perspective of the Operational Environment**

b. **Methodology.** A system is an interconnected or interrelated network, group, or chain – a functionally, physically, and/or behaviorally related group of regularly interacting or interdependent elements that forms a unified whole. JIPOE analysts develop a systems perspective of the operational environment through the identification and analysis of all major elements within friendly, adversary, or neutral PMESII systems and subsystems that are potentially relevant to the success of a joint operation. Based on understanding strategic objectives, the joint force's mission, and the JFC's intent, objectives, conditions required to achieve objectives, and tasks, the J-2 identifies PMESII systems and their subordinate components that are relevant to the mission and operation. Understanding the interaction of these systems with each other and how their



relationships will change over time can help the JFC visualize how joint force actions on one system can affect other systems. A variety of restraints, including available planning time and staff resources, will affect the detail of this determination.

(1) A system consists of interconnected nodes and links. Nodes represent the tangible elements within a system that can be targeted for action, such as people, places, or things (e.g., materiel or facilities). Links are the behavioral or functional relationships between nodes, such as the command or supervisory arrangements that connect a superior to a subordinate; the relationship of a vehicle to a fuel source; and the ideology that connects a propagandist to a group of terrorists. Links help the JFC and staff visualize how various systems work internally and interact with each other. They establish the interconnectivity between nodes that allows them to work together as a system – to behave in a specific way (accomplish a task or perform a function). Both nodes and links are symbolic representations meant to simplify the complexity of the real world, and are useful in identifying COGs and other things the JFC may wish to influence or change during an operation.

(2) Figure II-17 shows a simple example of nodes and links in an adversary's military system. The air defense system (a node in the military system) and its radars and

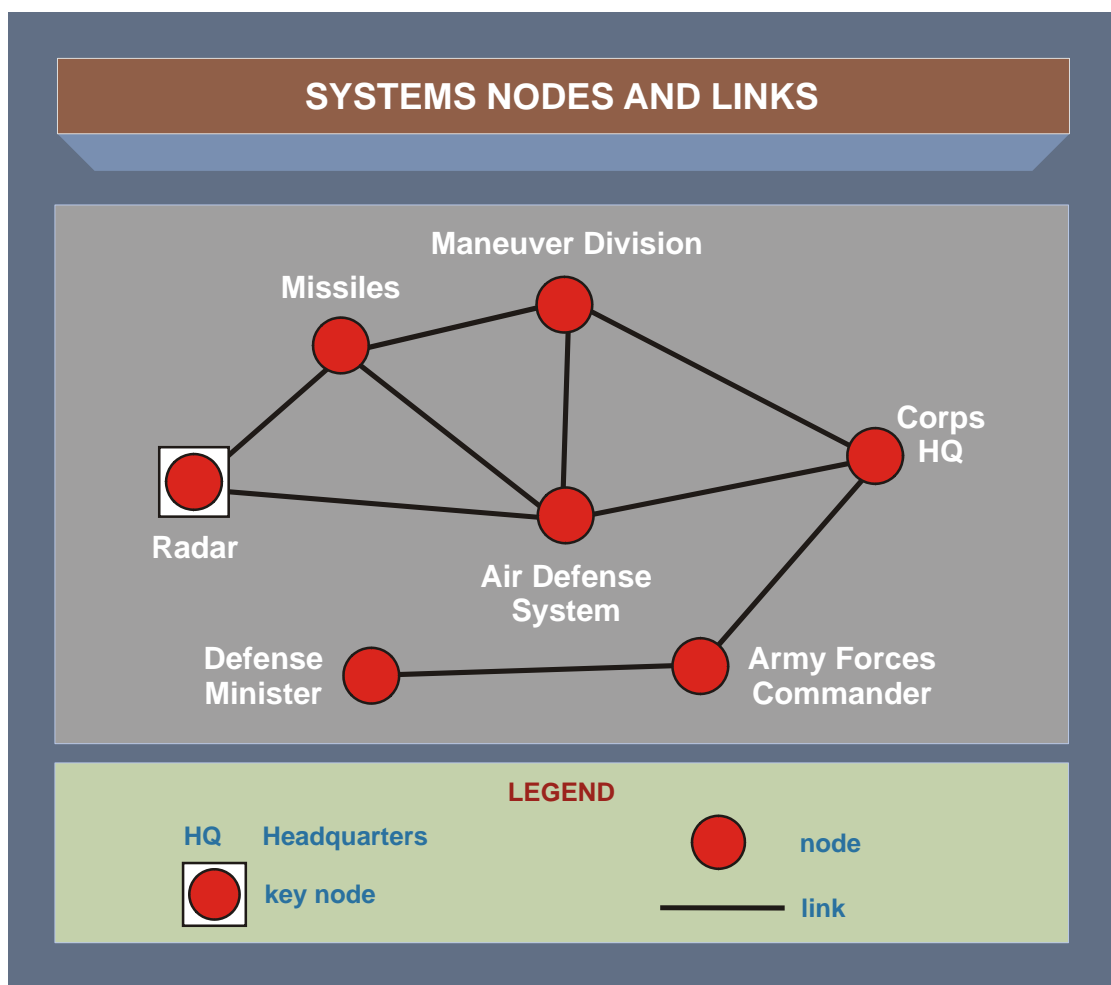


Figure II-17. Systems Nodes and Links

missiles (nodes in the air defense system) are linked to each other and to the maneuver divisions and corps headquarters by their role and ability to protect these nodes from air attack. If the system's radars are vulnerable to friendly antiradiation missiles, then using this advantage to attack and destroy the air defense radars eliminates the electromagnetic relationship (link) between the radars and air defense missile, degrading the air defense system's ability to function effectively. This reduces the level of air defense protection for the maneuver divisions and makes them more susceptible to friendly forces' attack. In other words, it could be unnecessary to attack all nodes in the air defense system in order to degrade its primary function. In this example, JIPOE analysts designate the air defense radars as a key node – a node that is critical to the functioning of the air defense system.

(3) Due to the complexity of graphically depicting an adversary's myriad PMESII nodes and links, JIPOE analysts will need to make maximum use of automated analytic tools. The following discussion describes the process for a network analysis in which relevant nodes are identified, links between nodes are determined and analyzed, key nodes are assessed, and the impact of PMESII variables on military operations are evaluated:

c. **Identifying relevant nodes.** Analyzing all possible nodes and links in the operational environment would be an insurmountable task. However, not all nodes and links are relevant to the JFC's mission. JIPOE analysts should develop their understanding in sufficient detail to identify relevant systems, subsystems, nodes, and potential key nodes. The identification of relevant nodes should be based on the evaluation of a variety of characteristics (including those already discussed in paragraph 11, "Developing a Geospatial Perspective of the Operational Environment") combined with an understanding of friendly strategic objectives, the joint force's mission, and the JFC's intent, objectives, conditions required to achieve objectives, and tasks.

(1) The following examples illustrate types of nodes that could be relevant to joint operations. At the lowest level, nodes are discrete persons, places, or things – such as a country's leader, a church, or a rocket launcher – that typically are not divided into subordinate parts. However, whether something is considered a node or a system typically depends on the perspective at a particular level of command. The CDR might think of the air defense system in Figure II-17 as a single node in the military's system, while the operational-level JFC and component commanders would think of it as a system composed of subordinate nodes (missiles, radars, etc.).

(a) **Sample Political Nodes:** advisors, governors, mayors, political interest groups, cabinet officials, courts, policy documents.

(b) **Sample Military Nodes:** individual leaders at all levels, plans and orders, defense ministry, C2 headquarters, air defense system, artillery maintenance facility, ammunition storage point, key terrain.

(c) **Sample Economic Nodes:** banks, corporations, trade unions, market places, shipping facilities, smugglers, commercial depots.

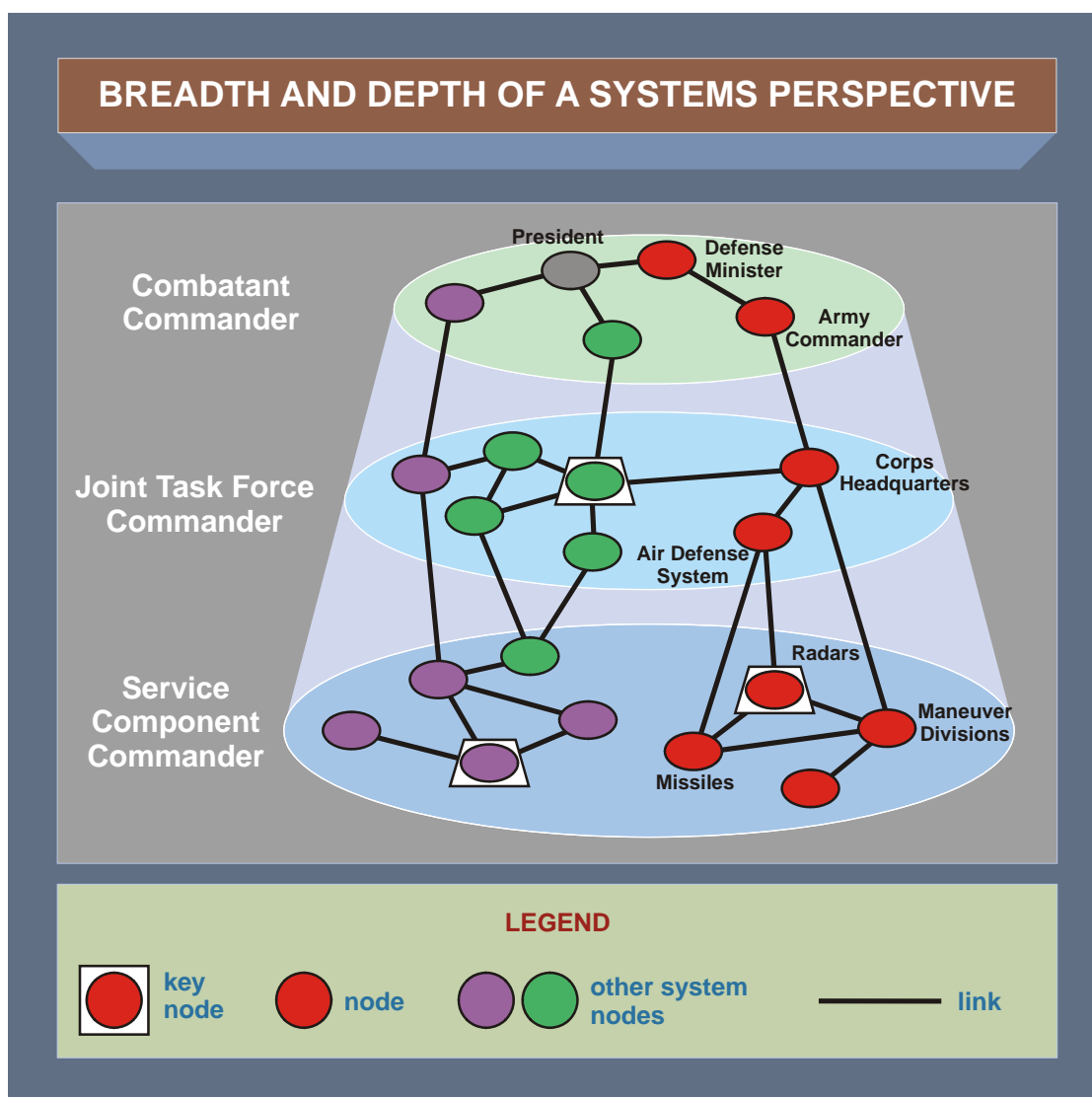
(d) **Sample Social Nodes:** ethnic groups, clans, tribes, religious groups, unions, associations, schools, cultural centers, health, and welfare facilities.

(e) **Sample Infrastructure Nodes:** nuclear power plants, hydroelectric dams, gas pipelines, aqueducts, pumping stations, railyards, airports, port facilities, relevant factories, hospitals, schools, civil defense shelters.

(f) **Sample Informational Nodes:** plans and orders, newspapers, information ministry, television networks, computer networks, information technology centers, intelligence agencies, postal facilities, radio stations, national or influential specialty magazines or periodicals, and other existing information infrastructure and information-dissemination capabilities.

(2) Related functional groupings of nodes and links have both horizontal and vertical aspects. Their relevance often depends on the required scale (breadth and depth) of the analysis as determined by the JFC's needs and the level at which the JFC operates. For example, Figure II-18 shows nodes and links in the operational environment that the CCDR, subordinate JFC, and Service component commanders might focus on relevant to their specific objectives, assigned tasks, and the higher commander's intent. The CCDR's operational environment in a specific operation can encompass an entire geographic region composed of many nation states. Thus, the combatant command's systems network analysis would focus on upper-level aspects of the specific systems relevant to the CCDR's strategic objectives and missions (the top tier in Figure II-18) and "drill down" to more detailed aspects of these systems as required. For example, from the CCDR's perspective an enemy armored corps could be a single node in the adversary's military system. But to the operational-level JFC and component commanders, the corps likely would be a separate system composed of operational- and tactical-level nodes and links representing maneuver units, C2 headquarters, and various supporting capabilities for air defense, indirect fire support, and logistics.

(3) All systems in the operational environment can be complex. For example, a typical social system consists of numerous subsystems, each having additional subordinate layers. There can be hundreds of nodes and links at different levels that compose the entire social system. However, many or all of these nodes and links might not be relevant to strategic objectives and the JFC's mission. For example, the J-2 might determine that a small-scale, focused operation such as evacuation of US citizens from an embassy will have little impact on a nation's and region's systems. But large-scale US and coalition military operations in a country will affect all major systems to a greater or lesser degree, and the impact likely will extend across the broader region as well. JIPOE analysts must identify likely undesired effects of large-scale military operations on these systems, such as the impact on the welfare, attitudes, and behavior of the population. While undesired effects might not jeopardize the JFC's accomplishment of near-term tasks and objectives, they could have long-term unintended consequences associated with



**Figure II-18. The Breadth and Depth of a Systems Perspective**

the region's or country's attitude toward the US, the CCDR's security cooperation plan and communication strategy, USG strategic communication themes and messages, and the USG's strategic end state. The JFC and planners must consider these potential undesired effects during COA comparison and selection. Appendix C, "Analyzing and Depicting a System," provides generic examples of the major systems and possible subsystems.

**d. Determining and Analyzing Node-Link Relationships.** Links are relationships among nodes and are derived from collected data or extrapolations based on collected data. A benefit of graphically portraying node-link relationships (in as much detail as time and resources permit) is that the potential impact of actions against certain nodes can become more evident. For example, the number of links between a node and other nodes can indicate the importance of the node to the larger functional grouping. The strength or intensity of a single link also could be relevant to determining the importance of the functional relationship between nodes and the overall significance to the larger system.

Therefore, both the number and strength of links to a node or set of nodes can be indicators of key nodes and a potential COG. Due to the potential complexity of systems relationships, graphic visualization techniques such as those described below can facilitate systems network analysis.

(1) **Association Matrix.** The format of an association matrix is useful in organizing relationship data and characterizing the links that exist (or are suspected to exist) among nodes. When constructing the association matrix, relevant nodes are plotted along a diagonal axis. An association between two nodes may be indicated at the intersection of the horizontal and vertical axis and may be characterized as confirmed or suspected, depending on locally established criteria. An example of an association matrix is depicted in Appendix D, “Specialized Products.”

(2) **Network Analysis Diagram.** Network analysis diagrams graphically depict relationships among a set of entities, which may be people, organizations, communities, or computers, so long as they are connected in meaningful ways. These links, or relationships, are properties of the group and can represent several different forms of interaction, including kinship (parent of, sibling of), role-based (boss of, rival of), interactive (travels with, meets with), and affective (trusts, likes) relationships. Links typically represent directions of influence among nodes rather than a linear progression. An example of a network analysis diagram is depicted in Figure II-19. JIPOE analysts can construct a systems network analysis diagram manually or through selected automated support systems, synchronization tools, etc. A consolidated network analysis diagram is constructed by combining the individual network diagrams of each system. Although specific network analysis methodology may be locally established, the following general procedures are recommended:

(a) Nodes are represented by circles, color coded to depict association with a specific system. The size of a node may vary to depict its relative centrality.

(b) Links are represented by lines between nodes. Solid lines indicate confirmed relationships, dashed lines indicate suspected relationships. Arrows may be used to characterize the relationship (e.g., subordination, flow of information).

(c) To the extent possible, nodes and links should be positioned so as to minimize the crossing of lines.

e. **Identify Key Nodes.** Key nodes exist in every major system and subsystem and are critical to the functioning of their associated systems. For example, a hydroelectric plant could be the key node in a metropolitan area’s power grid (a subsystem of the infrastructure system). Some may become decisive points for military operations since, when acted upon, they could allow the JFC to gain a marked advantage over the adversary or otherwise to contribute materially to achieving success. Weakening or eliminating a key node should cause its related group of nodes and links to function less effectively or not at all, while strengthening the key node could enhance the performance of the subsystem and larger system. Key nodes often are linked to, or resident in, multiple systems. For example, a country’s religion subsystem could be central to the

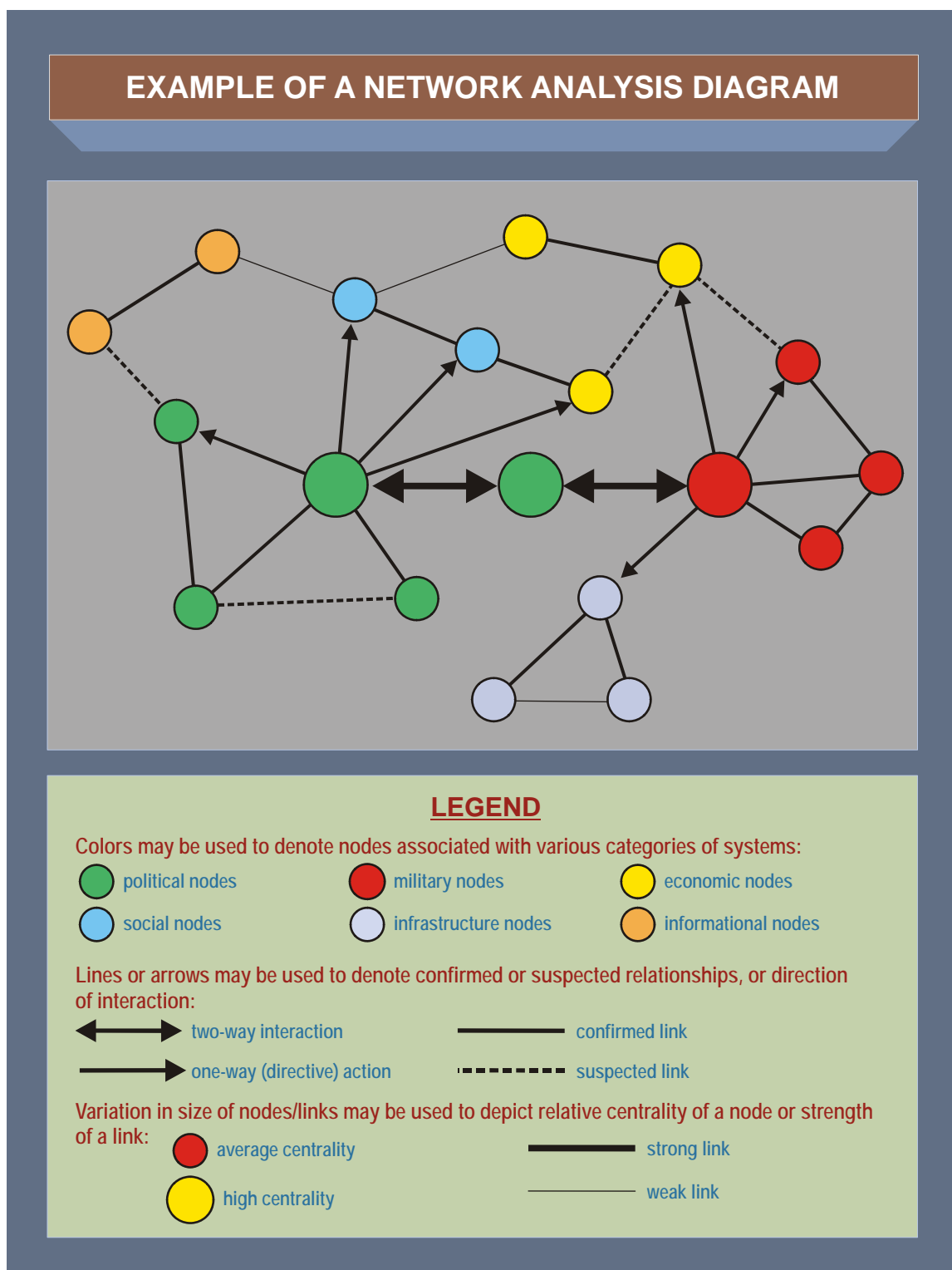


Figure II-19. Example of a Network Analysis Diagram

functioning of the country's social system, and the core group of religious leaders (or a

single leader) could be the religious system's key node. Depending on the country's social and political structure, this same group of religious leaders also could be a key node in the political system. Since each PMESII system and subsystem is composed of nodes and links, the capabilities of US instruments of national power (diplomatic, informational, military, and economic) can be employed against selected key nodes to create operational and strategic effects. Although largely influenced by subjective judgment, the identification of a potential key node may be facilitated through an analysis of node centrality (i.e., how individual entities fit in the systems network). Node centrality can highlight possible positions of importance, influence, or prominence, and patterns of connections. A node's relative centrality is determined by analyzing three measurable characteristics: degree, closeness, and betweenness (see Figure II-20).

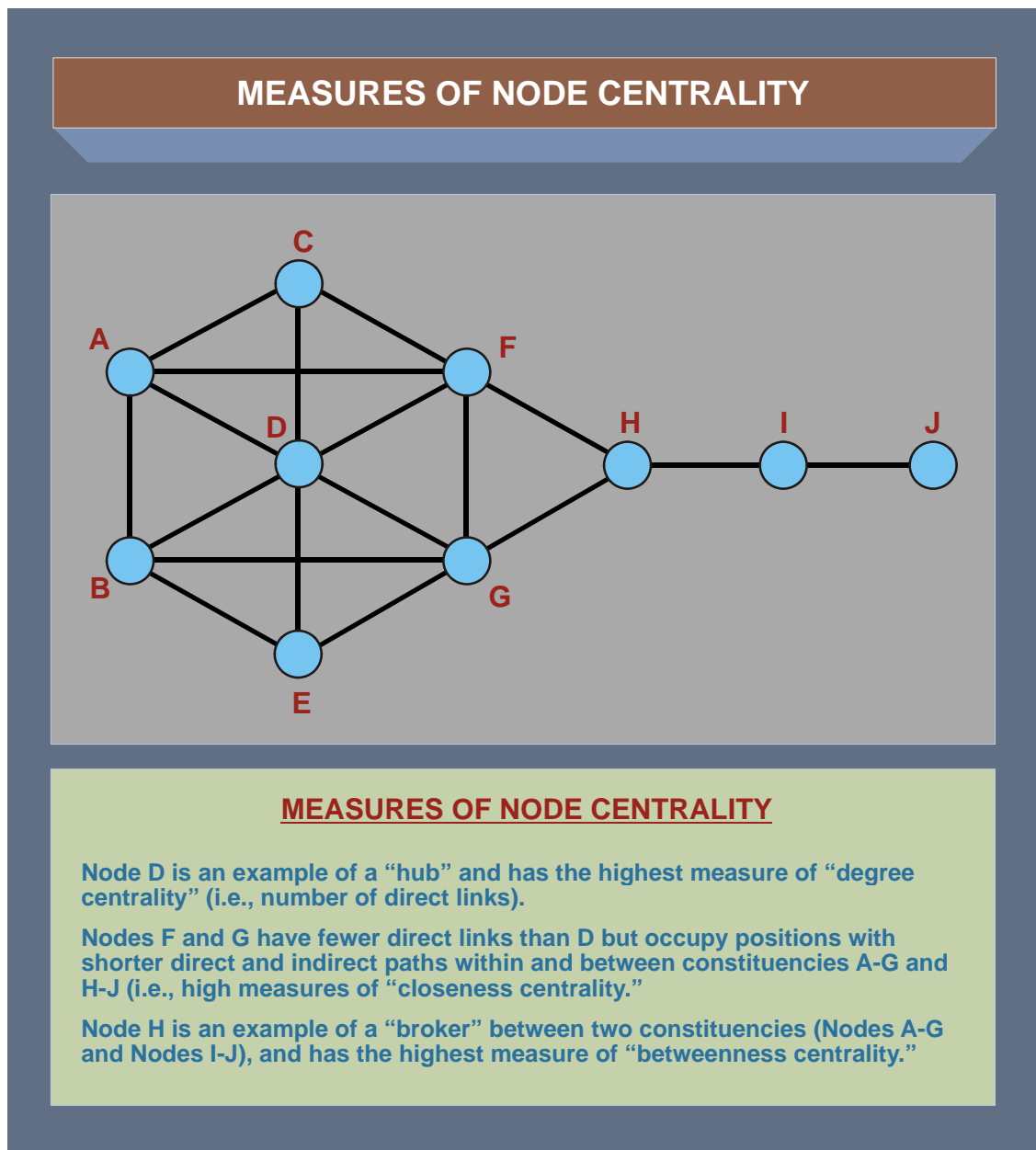


Figure II-20. Measures of Node Centrality



(1) **Degree** examines a node's centrality in terms of its direct links with other nodes (i.e., its local position in the network). As indicated in Figure II-20, node D has the highest number of direct links to other nodes (high degree centrality), and is an example of what may be termed a "hub." A network centralized around a well-connected hub may be efficient but can fail abruptly if that hub is disabled or removed. In this example, node D likely would be designated a key node. Nodes with low degree centrality (few direct links) are sometimes described as peripheral nodes (e.g., nodes I and J in Figure II-20). Although they have relatively low centrality scores, peripheral nodes can nevertheless play significant roles as resource gatherers or sources of fresh information from outside the main network.

(2) **Closeness** examines a node's overall position in a network (i.e., its global position). The difference between degree and closeness is an important distinction, because an individual entity may have many direct contacts, but those contacts may not be well connected to the network as a whole. Consequently, although an individual may have a high level of degree centrality, power and influence might only be exerted locally, not throughout the entire network. Closeness is calculated by adding the number of hops between a node and all others in a network (e.g., adding the number of hops from node A to node B, node A to node C, and node A to node D). A lower score indicates that an individual needs fewer hops to reach others in the network, and is therefore "closer" to others in the network. For example, nodes F and G in Figure II-20 have fewer direct links than node D, but have shorter paths to the other nodes. Nodes with high closeness centrality are in excellent positions to monitor the overall activity flow within the network.

(3) **Betweenness** measures the number of times a node lies along the shortest path between two others. For exchange of information or services a node with high betweenness may play an important "brokerage" or intermediary role. For example, in Figure II-20, node H would occupy one of the most important locations in the network by serving as the only link between nodes I, J and the remainder of the network. Node H is an example of a broker node and (assuming nodes I and J were sufficiently important to the network as a whole) it might also be designated as a key node. The elimination of a broker node can fragment a network into several subcomponents.

**f. Evaluate the Impact of Political, Military, Economic, Social, Infrastructure, and Informational Systems Networks on Military Operations.** Systems network analysis facilitates the identification of significant information about a group of entities that might otherwise go unnoticed. For example, network analysis can uncover positions of power within a network, show the basic subgroups that account for a network's structure, find individuals or groups whose removal would greatly alter the network, and measure network change over time. The impact of a system's network should be evaluated in terms of network density and distance.

(1) **Density.** Network density examines how well connected a network is by comparing the number of ties actually present in a network to the total number of ties possible. Network density can indicate many things. When a network is highly

interconnected fewer constraints exist for the individuals within it: they may be less likely to rely on others as brokers of information, be in a better position to participate in activities, or be closer to leaders, and therefore able to exert more influence upon them. A network with low interconnectivity may indicate that there are clear divisions within a network (e.g., along clan or political lines), or that the distribution of power or information is highly uneven and tightly controlled.

(2) **Distance.** Network distance measures the number of hops between any two nodes in a network. For example, there is one hop between two nodes that are directly connected; there are two hops between nodes that are separated by one intermediary node. Evaluating network distance aids in understanding how information and influence flow through a network and determining a network's cohesiveness. Larger distances can inhibit the dissemination of information because each hop diminishes the probability of successful interaction. In political, social, and possibly military networks, larger distances may also decrease the ability of individuals to influence others.

### **13. Describing the Impact of the Operational Environment on Adversary and Friendly Capabilities and Broad Courses of Action**

The evaluations of all the individual aspects of the operational environment and the systems perspective are ultimately combined into a single integrated assessment that focuses on the overall impact of the operational environment on all joint COAs available to both friendly and adversary forces. This assessment may take the form of a briefing, set of overlays, written analysis of the operational environment, intelligence estimate, or any other format the JFC deems appropriate. Regardless of format, this product is designed to support the development and evaluation of friendly joint COAs by providing the J-3 and J-5 with an evaluated and prioritized set of land, sea, and air avenues of approach, potential engagement areas, key terrain and maritime geography, key nodes and links, and an analysis identifying periods of optimal weather conditions for specific types of military operations. Likewise, the product enables the J-2 to evaluate the operational environment from the adversary's perspective, and to express this evaluation in terms of a prioritized set of adversary military COAs, to include any related diplomatic, informational, or economic options. In order to accomplish this, the J-2 must remember to consider the general military capabilities of the adversary force as well as the other characteristics of the operational environment. For example, the operational environment may contain several excellent amphibious landing sites, but if the adversary does not have access to amphibious support ships, then an amphibious attack should not be listed as a viable adversary COA. The J-2 should also consider the amount of military force normally located at each of the adversary's naval, ground, and air bases and should assess whether this constitutes an offensive or defensive posture. The final result of step two of the JIPOE process is a preliminary prioritization of adversary COAs based on how well each is supported by the overall impact of the operational environment. This preliminary prioritization of COAs will be further refined and adjusted during step four of the JIPOE process, discussed later in this chapter.

## SECTION C. EVALUATING THE ADVERSARY

*"However absorbed a commander may be in the elaboration of his own thoughts, it is sometimes necessary to take the enemy into consideration."*

**Winston Churchill,  
The World Crisis, 1911-1918  
1923**

### 14. Overview

The third step in the JIPOE process identifies and evaluates the adversary's capabilities and limitations, current situation, COGs, and the doctrine, patterns of operation, and TTP employed by adversary forces, absent those constraints identified during step two (see Figure II-21). During this step, models are developed that portray how adversary forces normally execute military operations or how they have reacted to specific military situations in the past. Adversary systems are also analyzed to develop candidate indicators (hypothesized anticipated changes to normal node-link relationships) associated with various COAs.

a. The JIPOE analyst must take care not to evaluate the adversary's joint capabilities by mirror-imaging US joint and Service doctrine. Effective red teams serve as a check on the analytical effort to avoid mirror imaging, to include identifying COAs not considered.

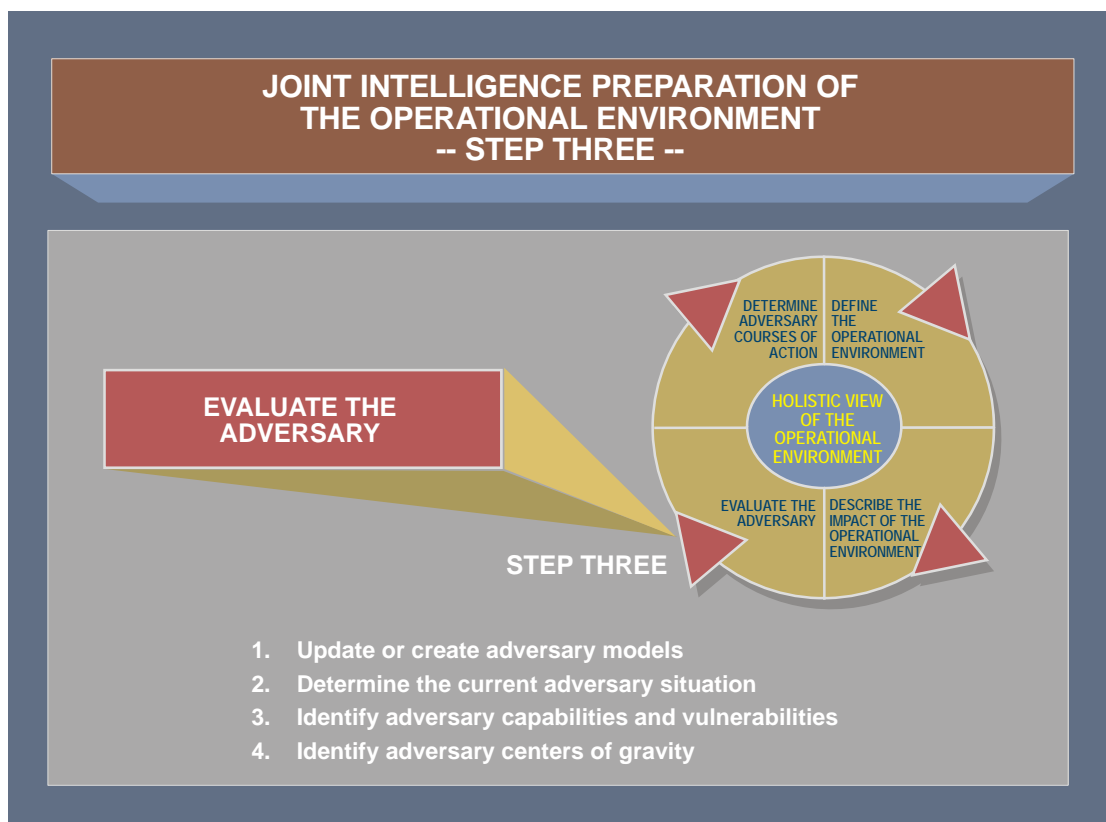


Figure II-21. Joint Intelligence Preparation of the Operational Environment – Step Three

In many cases the joint doctrine of potential adversaries may be embryonic or nonexistent. Although an adversary's components may operate in the same geographic area and may try, more or less, to support each other, joint operations, as practiced by US forces, are rarely conducted. Nevertheless, in virtually all cases, the Service components of an opposing force will at some level of command coordinate their operations according to a set of ad hoc or established procedures. The JIPOE analyst must try to discern the adversary's ability to integrate air, sea, and land capabilities in combined arms operations, no matter how rudimentary it may appear.

b. Adversary capabilities are identified in terms of broad COAs and supporting operations that the adversary can take that may influence the accomplishment of the friendly mission. Failure to accurately evaluate the adversary may cause the command to be surprised by an unexpected adversary capability, or result in the unnecessary expenditure of limited resources against adversary force capabilities that do not exist.

### 15. Updating or Creating Adversary Models

Adversary models can depict either an opponent's doctrinal way of operating or their observed patterns of operation under similar conditions. They serve the JFC best when they are not only based on a detailed study of the adversary's normal or "doctrinal" organization, equipment, operational procedures, and node-link relationships, but also take into account how the adversary will react to a specific military situation. Adversary models are normally completed prior to deployment, and are continuously updated as required during military operations. The models consist of three major parts: graphical depictions of adversary patterns of operations related to specific COAs (adversary templates); descriptions of the adversary's preferred tactics and options; and lists of high-value targets (HVTs).

a. **Adversary Templates.** Adversary templates illustrate the employment patterns and dispositions preferred by an adversary in the same or a similar operational environment. They are usually scaled graphic depictions of adversary dispositions for specific types of military (conventional or unconventional) operations such as: movements to contact, antisurface warfare operations, insurgent attacks in urban areas, combat air patrols, and aerial ambushes. JIPOE utilizes single service adversary templates that portray adversary land, sea, air, special, or space operations, and produces joint adversary templates that portray the relationships between all the adversary's service components when conducting joint operations. For example, a joint adversary template illustrating an adversary's conventional land offensive, in addition to showing ground force organization and disposition, would also portray the type, number, deployment pattern, and tactics of all supporting assets. An adversary template may also be used to depict anticipated changes to PMESII nodes and links that would be indicative of specific adversary intentions or COAs.

(1) **Threat Template Depicting a Geospatial Perspective.** Geospatially-oriented adversary templates depict the adversary's preferred method of operation in each physical domain (land, air, maritime, space) for each of the adversary's force components

(see Figure II-22 and Figure II-23). Joint adversary templates should be constructed for all of an adversary's broad joint COAs, such as attack, defend, reinforce, or retrograde. Adversary templates are constructed by analyzing all available intelligence on the adversary's patterns of operation and through an evaluation of the adversary's past operations, military exercises, and preferred practices. Specific factors that should be addressed on this type of adversary template include, but are not limited to:

- (a) Organization for combat;
- (b) Distances (such as frontages, depths, boundaries, spacing between ships, and intervals between march units or waves of attacking aircraft);
- (c) Functions (such as disruption, assault, exploitation, fixing, contact,

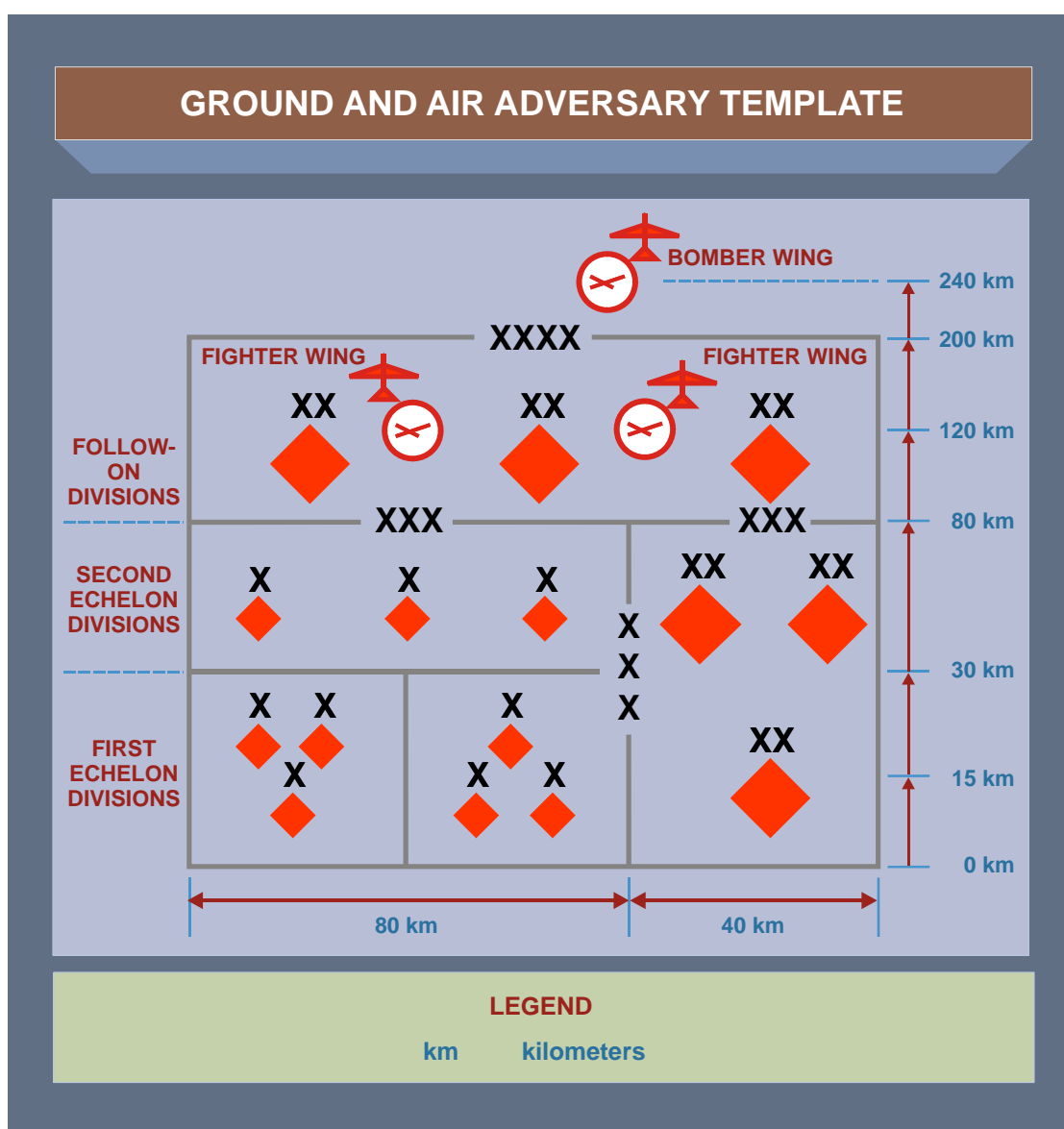
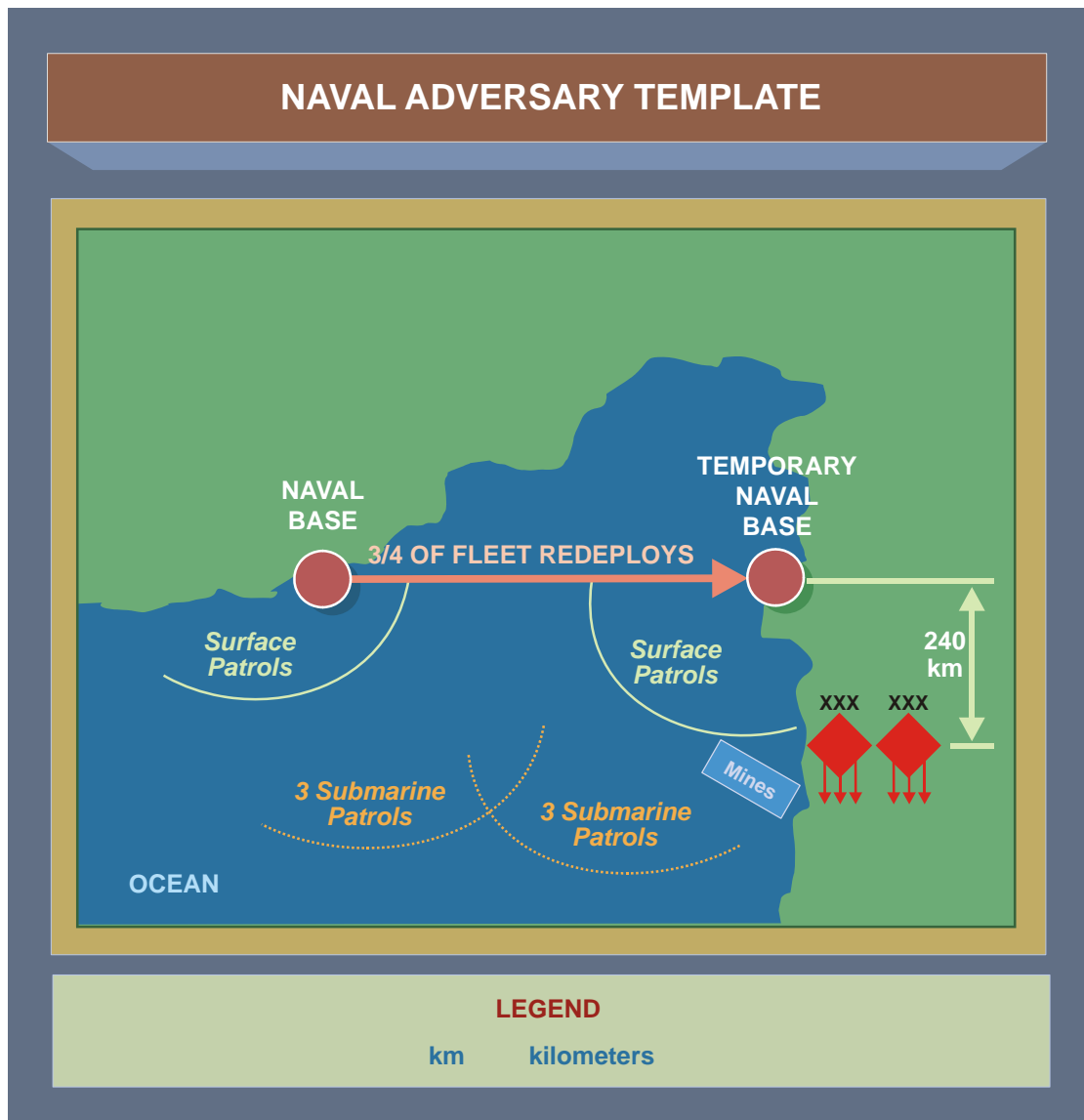


Figure II-22. Ground and Air Adversary Template



**Figure II-23. Naval Adversary Template**

shielding, or counterattack) that various parts of the adversary force are intended to perform in order to accomplish objectives in a certain type of operation;

- (d) Engagement areas;
- (e) Patterns for the use of terrain and weather;
- (f) Timing and phasing of operations; and
- (g) Relative locations and groupings of forces and support units.

(2) **Thread Template Depicting a Systems Network Perspective.** JIPOE analysts should also identify anticipated changes in node-link relationships (e.g., establishment of potential new links, disestablishment or modification of current links)

that could be indicative (when or if established) of an adversary's future COAs. These postulated deviations from the normal (or current) node-link structure are potential indicators of adversary intentions and should be based on the adversary's past practices, patterns of operation, physical requirements, or expected preferences. For clarity, an association matrix may be used to summarize the anticipated node-link changes associated with each COA. This type of modified association matrix forms a systems perspective counterpart to the more geospatially oriented adversary templates discussed above. Figure II-24 provides an example of a systems perspective adversary template.

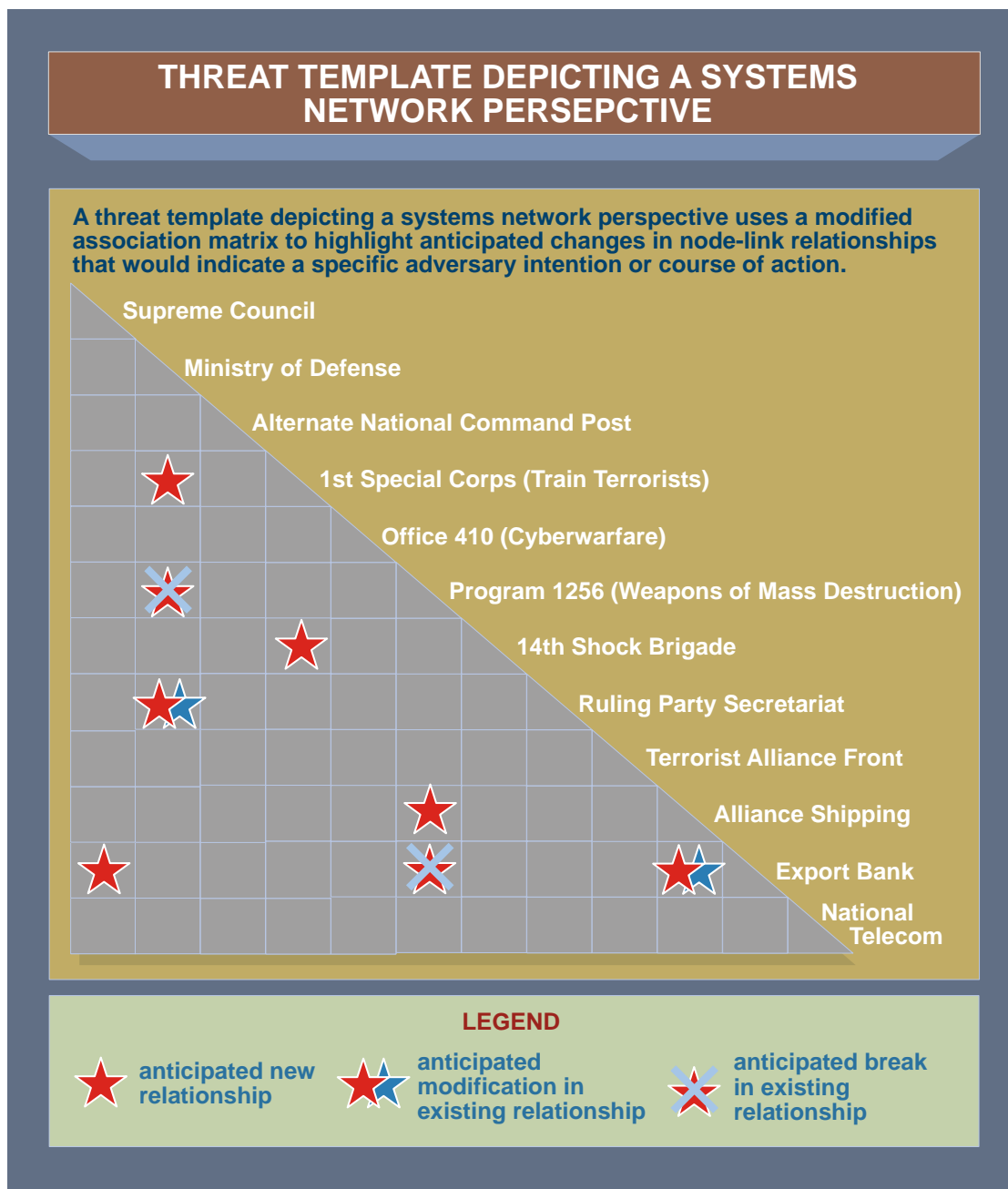


Figure II-24. Systems Perspective Adversary Template



**b. Description of Adversary Tactics and Options.** In addition to the graphic depiction of adversary operations portrayed on the adversary template, an adversary model must also include a written description of an opponent's preferred tactics. This description should address the types of activities and supporting operations that the various adversary units portrayed on the adversary template are expected to perform. It also contains a listing or description of the options (branches) available to the adversary — should either the joint operation or any of the supporting operations fail — or subsequent operations (sequels) if they succeed. For example, an opponent might prefer to follow successful attacks with pursuit. Should an attack begin to fail, the adversary's preferred branches might include committing reserves, reinforcements, or shifting the main effort. Should the attack fail, the preferred sequel might be a hasty defense. Additionally, an opponent's preferences regarding the use of weather or terrain must be addressed. For example, some adversaries may prefer to initiate offensive action during snowstorms or at night. The following are some suggested techniques for use when formulating a description of adversary tactics and options.

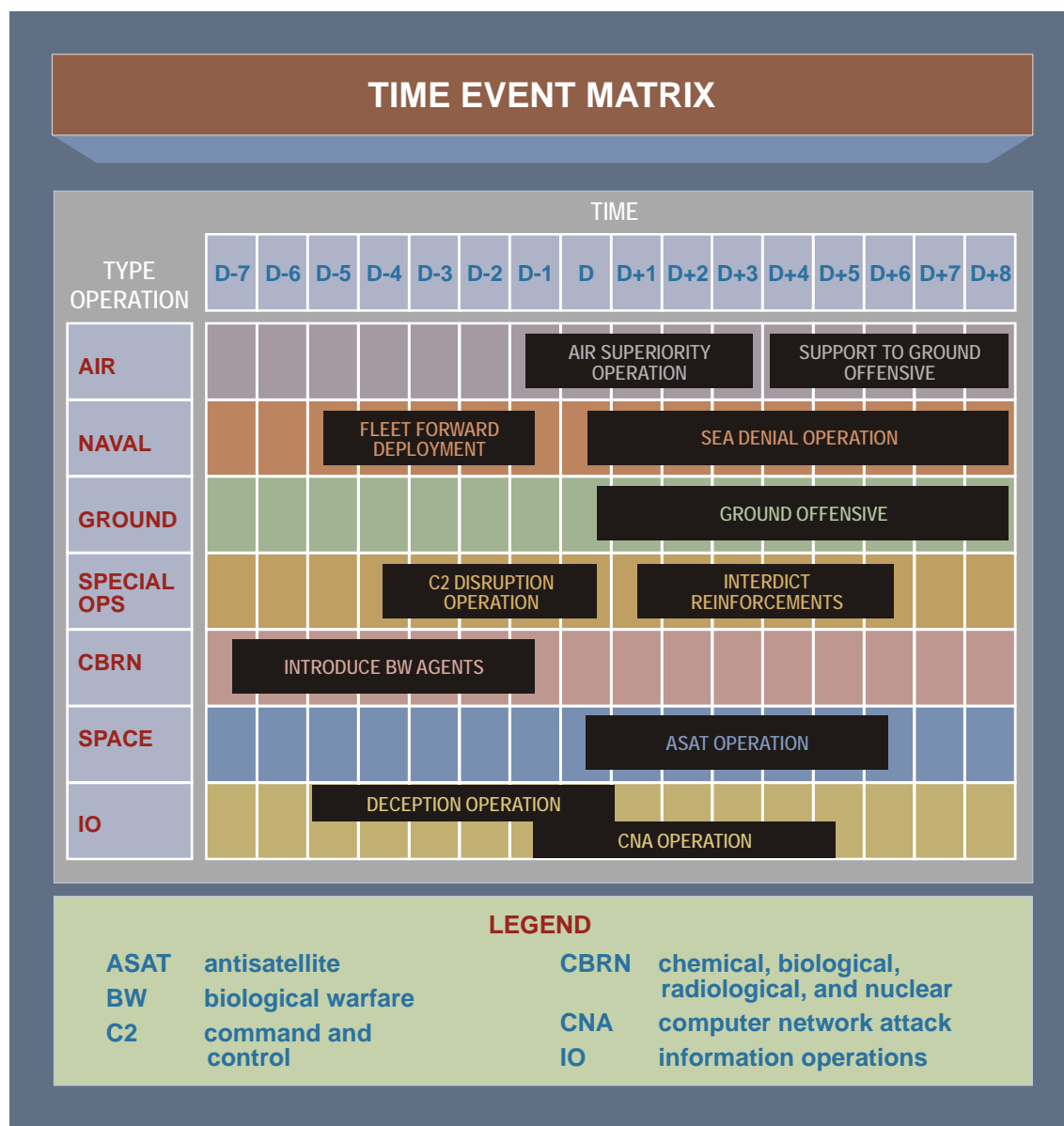
(1) Start by identifying a specific type of joint operation, such as an amphibious attack, and then analyze how each of the adversary's service components "fits in" or provides support to that operation. In other words, identify the types of supporting operations each component is likely to conduct as part of the adversary's overall joint plan.

(2) Use time-event matrices to describe how an adversary normally conducts specific types of joint operations. For example, it may be impossible to graphically depict the complex relationships between the air, naval, and ground operations of a joint offensive campaign. In this case, a time event matrix could be used to show the sequencing of specific types of joint and/or single component supporting operations, as well as changes in the organization, composition, and likely disposition of adversary forces during each phase of the joint offensive (see Figure II-25).

(3) Annotate the adversary template with marginal notes that are tagged to key events or positions on the template. For example, marginal notes might describe how an adversary normally reallocates air assets if a breakthrough is achieved during a ground offensive.

(4) Identify and list any decision criteria known to cause the adversary to prefer one option over another. This information will aid in wargaming adversary and friendly COAs, targeting, and deception planning.

(5) Describe the actions of each component of the joint force in sufficient detail to facilitate the later identification of HVTs and high-payoff targets (HPTs). (A high payoff target is a target whose loss to the enemy will significantly contribute to the success of the friendly course of action. High-payoff targets are those high-value targets that must be acquired and successfully attacked for the success of the friendly commander's mission.) Since the target's value usually varies with its role in each phase of the operation, each phase should be examined and described separately.



**Figure II-25. Time Event Matrix**

c. **List of High-Value Targets.** The adversary model must also include a list of HVTs. HVTs are those assets that adversary commanders require for the successful completion of their mission (and supporting missions) that are depicted and described on the joint adversary template. These targets are identified by combining operational judgment with an evaluation of the information contained in the joint adversary template and description. Assets are identified that are critical to the joint mission's success, that are key to each component's supporting operation, or that are crucial to the adoption of various branches or sequels to the joint operation. For example, an adversary ground force defending a front across a peninsula may be vulnerable to amphibious flanking attacks in its rear area. In this situation, the adversary's ability to deny access to its rear area coastal waters may be crucial, and therefore its coastal defense assets (artillery, antiship cruise missiles, local surface and subsurface combatants) may constitute HVTs.

The JFC, in conjunction with the national IC, collaborates in the identification of HVTs with appropriate analytic production centers. This collaboration should be conducted by any available secure communications means (e.g., JWICS, video teleconference, secure voice, SIPRNET). The following techniques may be useful in identifying and evaluating HVTs:

(1) Identify HVTs by mentally wargaming and thinking through the joint operation under consideration and how the adversary will use the assets of each component to support it.

(2) Determine how the adversary might react to the loss of each identified HVT. Consider the adversary's ability to substitute other assets (from another component or a different operational area), or to adopt a different option.

(3) Evaluate and rank order all HVTs according to their relative worth to the adversary's operation. Also, analyze whether a target's value depends on, or changes with, each phase of the operation.

(4) Construct a target value matrix by grouping HVTs according to their function. The target value matrix should indicate the relative worth of each HVT category and describe how an attack on that category (to include the timing of the attack) would affect the adversary's operation (see Figure II-26).

*Specific information on HVT identification and analysis is contained in JP 3-60, Joint Targeting.*

### **16. Determining the Current Adversary Situation**

All available intelligence sources, methods, and databases should be continuously exploited in an effort to analyze and determine the current adversary situation. This analytic effort should focus on OB factors for each adversary air, naval, SOF, and ground unit known to be deployed within the AOI, or that is otherwise capable of interfering with the friendly mission.

a. Current information pertaining to the composition and disposition of adversary forces is particularly important and will normally be maintained on the J-2's adversary situation overlay.

b. The current adversary situation is based on assessments of the following OB factors for each adversary force or military unit:

(1) Composition

(2) Disposition

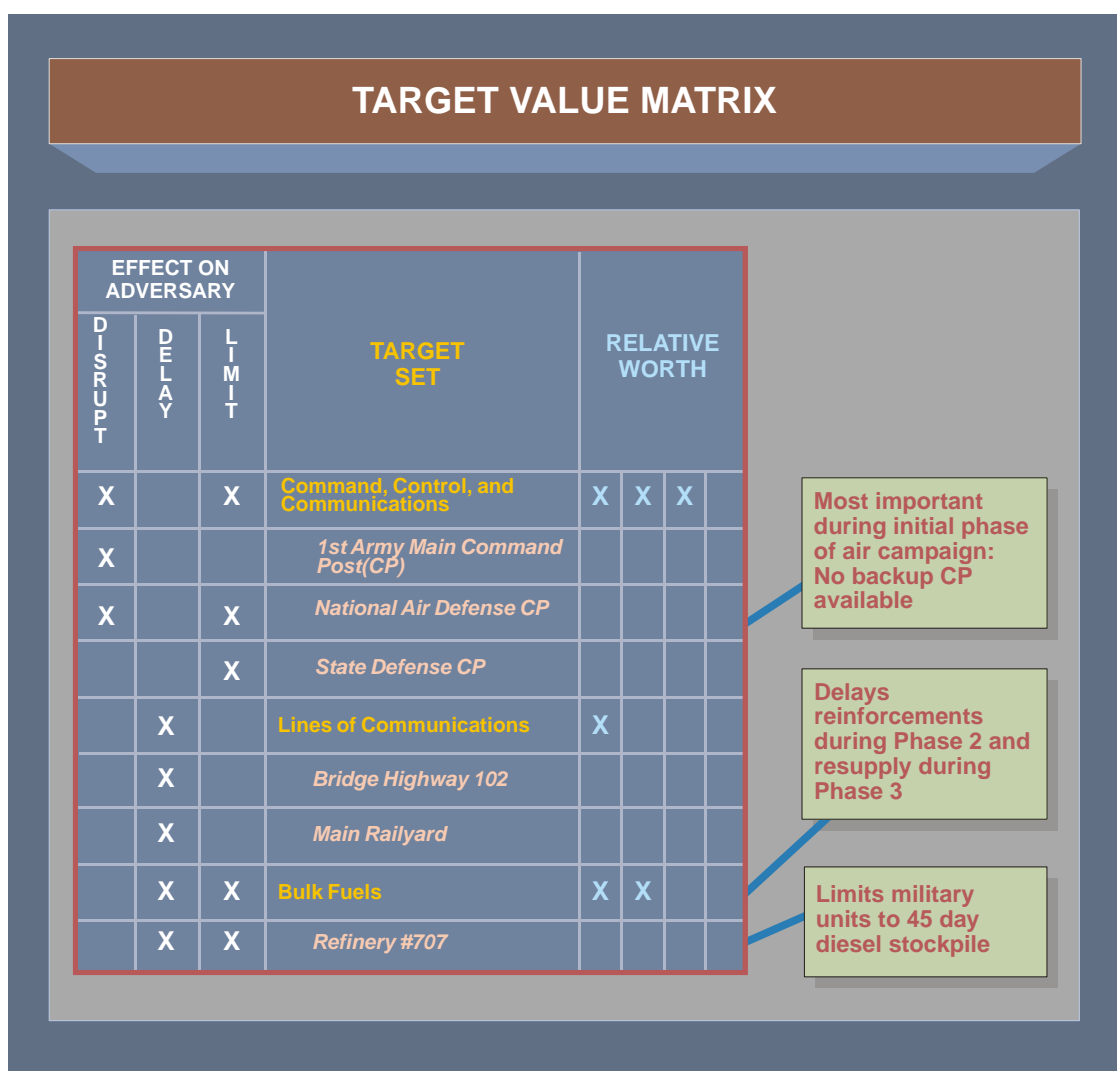


Figure II-26. Target Value Matrix

(3) Strength

(4) TTP

(5) Training status

(6) Logistics

(7) Effectiveness

(8) Electronic technical data

(9) Personalities

(10) Miscellaneous data (information that contributes to knowledge; historical studies, cultural idiosyncrasies, civil-military relations)

## 17. Identifying Adversary Capabilities and Vulnerabilities

Adversary capabilities are expressed in terms of the broad COAs and supporting operations that the adversary can take to interfere with the accomplishment of the friendly mission. In conventional operations, these are generally defined as offense, defense, reinforcement, and retrograde. Each of these broad COAs can be divided into a variety of more specific COAs. For example, a retrograde might take the form of a delay or withdrawal, while an offensive operation might consist of an envelopment or penetration. Other significant capabilities may include the use of CBRN weapons, amphibious assaults, EW, or deception operations. Such deception can involve misinformation, disinformation, or propaganda targeting specific or general audiences. IO and public affairs staffs collaborate and synchronize their respective information activities to counter adversary information influence efforts. Additionally, when appropriate, the techniques described below should also be applied to adversary nonmilitary or paramilitary groups capable of influencing the friendly mission.

a. Adversary capabilities are determined by comparing the current adversary situation with each of the adversary models already constructed. Based on the current situation, the ability of the adversary to actually meet the criteria described by each adversary model is evaluated. Usually, the adversary's actual capabilities will vary from the ideal capabilities represented by an adversary model. Adversary capabilities that fall short of requirements reflected in previous patterns of operation or adversary doctrine should be identified as vulnerabilities, while capabilities that meet or exceed requirements are listed as strengths. When time or some other factor is assessed to be a critical element in an adversary capability, it should be explicitly stated in the overall capability statement as shown below.

### EXAMPLES OF ADVERSARY CAPABILITIES

(1) "The adversary has the capability to attack with up to six divisions supported by 150 daily sorties of fixed-wing aircraft, but is capable of penetrating no further than line BRAVO due to insufficient fuel reserves."

(2) "The adversary has the capability to interdict friendly SLOCs at chokepoints GREY and BLUE after repositioning units of the 4th Fleet. Current naval deployments preclude an attack before 4 August."

(3) "Adversary insurgents will have the capability to resume offensive action after the fall harvest is completed in October."

- Various Sources

b. The J-2 should disseminate the evaluation of adversary capabilities, strengths, and weaknesses to the other joint force staff sections as soon as possible. The intelligence estimate is the traditional vehicle for disseminating this type of evaluation. However, in order to facilitate operational planning, the evaluation may be disseminated by any means and in any form deemed appropriate by the JFC.

## 18. Identifying Adversary Centers of Gravity and Decisive Points

a. **Centers of Gravity.** One of the most important tasks confronting the JIPOE analyst is the identification of adversary COGs. A COG is defined as the source of power that provides moral or physical strength, freedom of action, and will to act. A COG is always linked to the objective. If the objective changes, the COG could also change. At the **strategic level**, a COG could be a military force, an alliance, political or military leaders, a set of critical capabilities or functions, or national will. At the **operational level** a COG often is associated with the adversary's military capabilities — such as a powerful element of the armed forces — but could include other capabilities in the operational environment. Since the adversary will protect the COG, the COG most often is found among strengths rather than among weaknesses or vulnerabilities. JIPOE analysts continuously assess the adversary's leadership, fielded forces, resources, infrastructure, population, transportation systems, and internal and external relationships to determine from which elements the adversary derives freedom of action, physical strength, or the will to fight. A determination is made to see if candidate COGs are truly critical to the adversary strategy and must include a thorough examination of the mechanisms and linkages by which COGs affect adversary strategy and potential COAs. Figure II-27 shows a number of characteristics associated with COGs.

(1) The most effective method for JIPOE analysts to identify adversary COGs is to visualize each COG's role/function relative to each of the various systems and subsystems. For example, the leader of an adversary nation could be a strategic COG in the military and political systems as well as a key node in the nation's social system. Analysts also can visualize a COG as a system (nodes, links, functions, etc.) to analyze what elements within this system protect, sustain, integrate, or enable its various elements or components. In this context, a COG might be composed of nodes and links entirely within a single system, which is more often the case in the *seize initiative* and *dominate* phases of large-scale combat operations. However, a COG can also be composed of a set of cross-system nodes and links that might encompass key nodes of one or more systems. This distinction provides visibility to these nodes in the targeting process and emphasizes their potential importance to the operation.

(2) A COG typically will not be a single node in the system, but will consist of a set of nodes and their respective links. However, a single node might be considered a COG as an exception, such as when the adversary senior military leader is also the political leader and the nature of the adversary's political and military systems is such that the leader's demise would cause support for the conflict by other leaders in these systems to collapse. Also, systems are viewed differently at different levels. For example, the CDR might consider an adversary critical capability (such as an armored corps) to be a single node in the adversary's military system, while a JTF commander who must attack this capability would analyze it as a system of nodes and links in an effort to determine its critical capabilities and vulnerabilities.

(3) The JIPOE staff should analyze COGs within a framework of three **critical factors** — critical capabilities, requirements, and vulnerabilities. **Critical capabilities** are

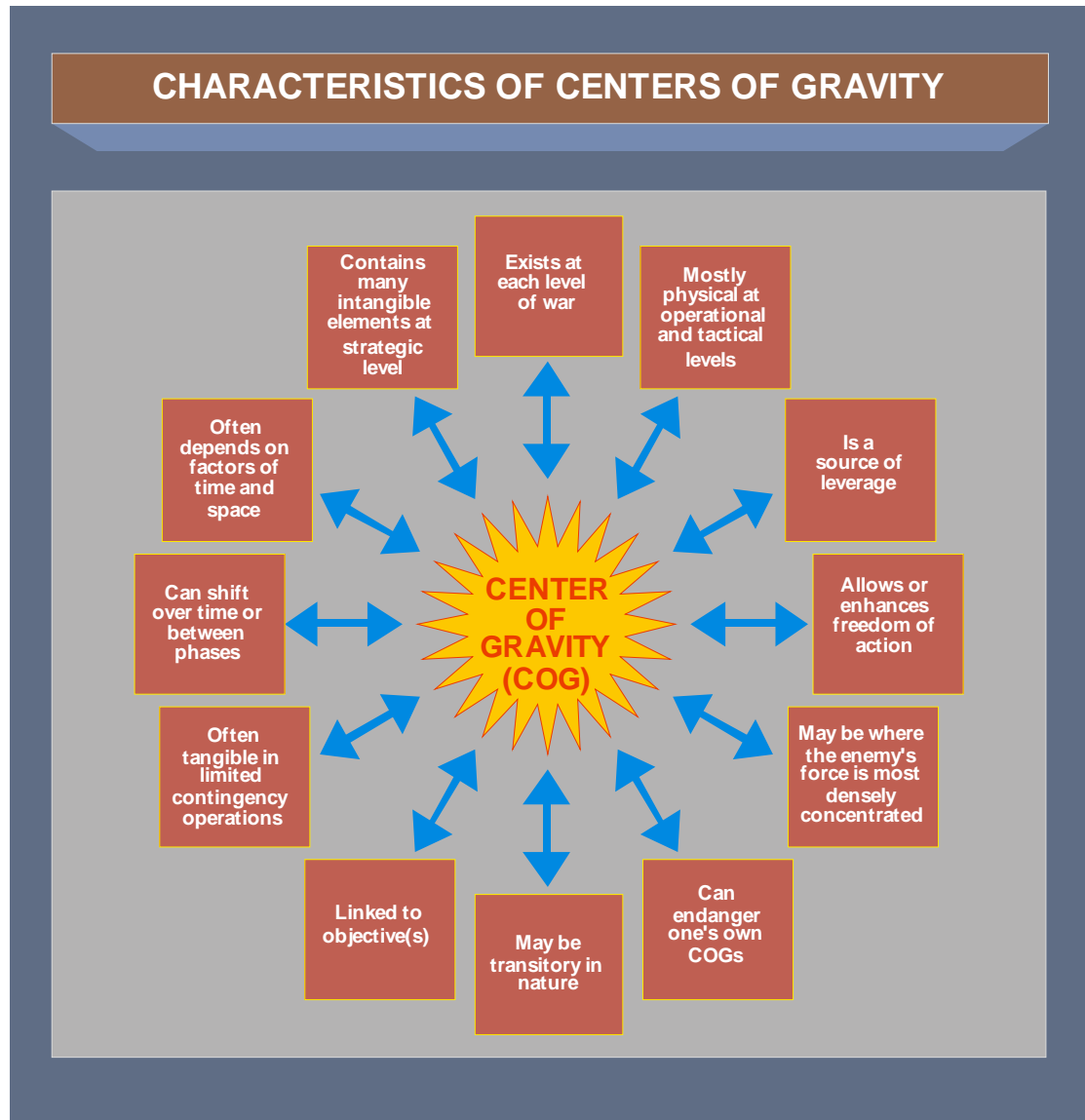


Figure II-27. Characteristics of Centers of Gravity

those means that are considered crucial enablers for a COG to function as such, and are essential to the accomplishment of the adversary's specified or assumed objective(s). **Critical requirements** are the conditions, resources, and means that enable a critical capability to become fully operational. **Critical vulnerabilities** are those aspects or components of critical requirements that are deficient, or vulnerable to direct or indirect attack in a manner achieving decisive or significant results. However, in identifying critical vulnerabilities, JIPOE analysts must also compare their criticality with their accessibility, vulnerability, redundancy, ability to recuperate, and impact on the civilian populace. JIPOE analysts use a systems perspective to identify the critical factors associated with each adversary COG. For example, Figure II-28 depicts the critical capabilities, critical requirements, and critical vulnerabilities associated with two of the adversary's strategic and operational COGs.



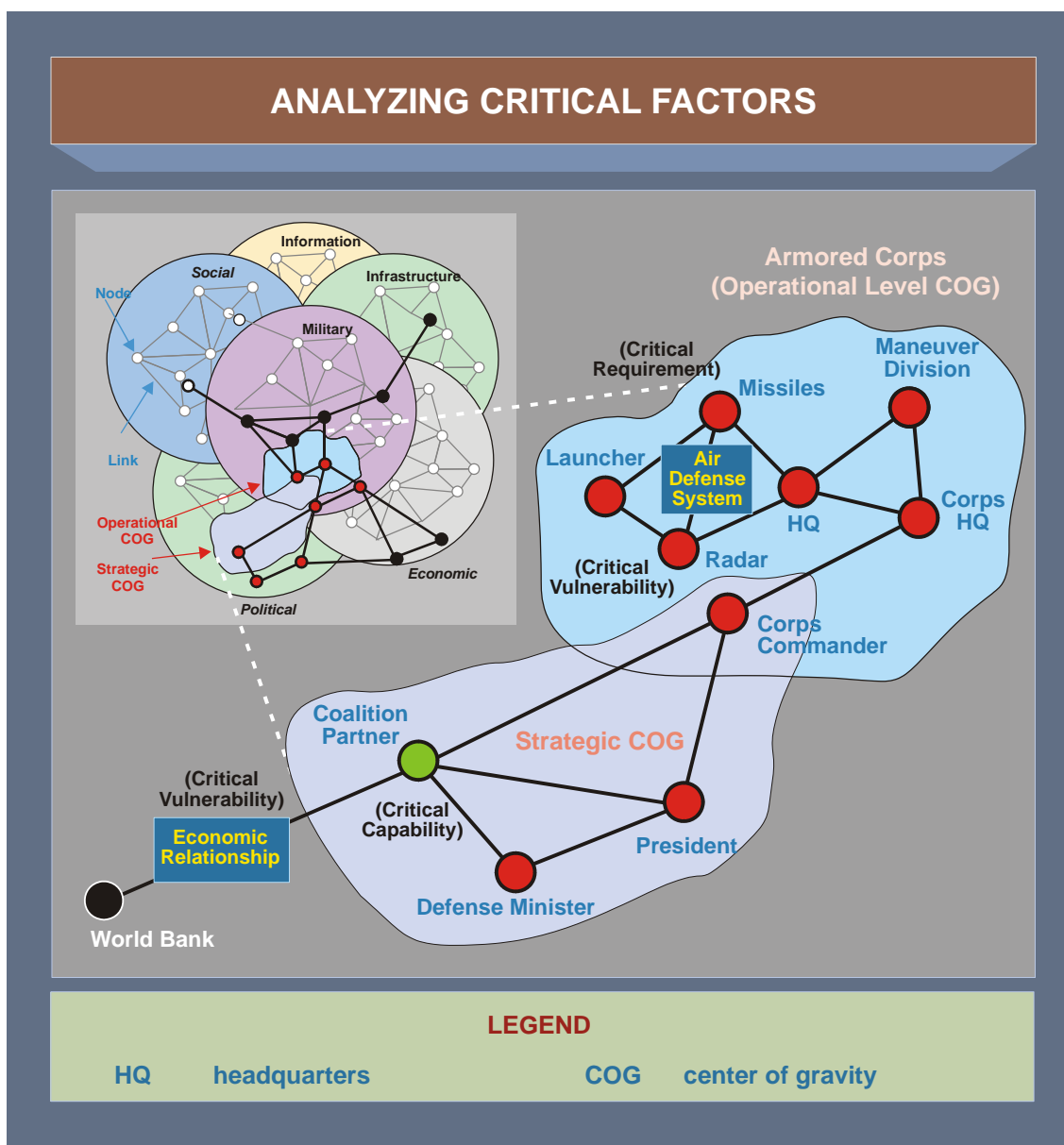


Figure II-28. Analyzing Critical Factors

### CENTER OF GRAVITY AND CRITICAL VULNERABILITIES

During the Battle of Britain in 1940, an operational center of gravity for Britain was the Royal Air Force Fighter Command. A critical capability for Fighter Command was the ability to meet Luftwaffe attacks in a timely manner. The critical requirement linked to that specific critical capability was advance warning regarding the timing, strength and direction of Luftwaffe attacks. The critical vulnerability linked to that specific critical requirement was the fragility and vulnerability of the British radar system that provided the advance warning. However, the Germans did not realize the importance of the radar system and did not follow up their early attacks against it.

SOURCE: Joe Strange,  
Marine Corps University Perspectives on Warfighting, Number 4, 1996

(4) A proper analysis of adversary critical factors must be based on the best available knowledge of how adversaries organize, fight, think, make decisions, and their physical and psychological strengths and weaknesses. JIPOE analysts must understand their adversaries' capabilities and vulnerabilities, and factors that might influence an adversary to abandon or change strategic objectives. They must also envision how friendly forces and actions appear from the adversaries' viewpoints. Otherwise, they may fall into the trap of ascribing to an adversary's particular attitudes, values, and reactions that mirror their own.

b. **Decisive Points.** A decisive point is a geographic place, specific key event, critical factor, or function that, when acted upon, allows a commander to gain a marked advantage over an adversary or contributes materially to achieving success (e.g., creating a desired effect, achieving an objective). This can greatly influence the outcome of an action. Decisive points can be physical in nature, such as a constricted sea lane, a hill, a town, WMD capabilities, or an air base; but they could include other elements such as command posts, critical boundaries, airspace, or communications and/or intelligence nodes. In some cases, specific key events also may be decisive points, such as attainment of air or maritime superiority, commitment of the adversary's reserve, or opening a supply route during humanitarian operations. In still other cases, decisive points may have a larger systemic impact, such as a node or combination of nodes which, when acted on, can substantially affect the operational environment's systems.

(1) The most important decisive points can be determined from analysis of critical factors. As part of the node-link network analysis associated with a systems perspective, understanding the relationship between a COG's critical capabilities, requirements, and vulnerabilities can illuminate decisive points.

(2) JIPOE analysts should identify and study potential decisive points and determine which of them offer the best opportunity to attack the adversary's COGs indirectly, extend friendly operational reach, or enable the application of friendly forces and capabilities.

*"How can one man say what he should do himself, if he is ignorant of what his adversary is about?"*

**Lt Gen Antoine-Henri,  
Baron de Jomini, 1838**

## SECTION D. DETERMINING ADVERSARY COURSES OF ACTION

### 19. Overview

The first three steps of the JIPOE process help to provide JFCs, subordinate commanders, and their staffs with a holistic view of the operational environment by analyzing the impact of the operational environment, assessing adversary doctrine and

capabilities, and identifying adversary COGs and decisive points. The fourth step of the JIPOE process builds upon this holistic view to develop a detailed understanding of the adversary's probable intent and future strategy. The process for step four (see Figure II-29) provides a disciplined methodology for analyzing the set of potential adversary COAs in order to identify the COA the adversary is most likely to adopt, and the COA that would be most dangerous to the friendly force or to mission accomplishment.

### 20. Identifying the Adversary's Likely Objectives and Desired End State

The adversary's likely objectives and desired end state are identified by analyzing the current adversary military and political situation, strategic and operational capabilities, and the sociocultural characteristics of the adversary. The JIPOE analyst should begin by identifying the adversary's overall strategic objective, which will form the basis for identifying subordinate objectives and desired end states. The J-2 should identify likely objectives for all major adversary military forces operating in the joint force's AOI. Usually there will not be sufficient information available to state adversary objectives as fact. In such cases, the J-2 will postulate likely adversary objectives and will identify them as assumptions. These assumptions should be coordinated with the JFC and J-3. Adversary objectives may be expressed in terms of the echelon or type of military force to be decisively engaged (such as aircraft carriers, operational reserves, or lift capabilities) or as key geographic features to be seized or retained. Sometimes objectives will have dual purposes. During World War II, the Japanese attack against Midway was designed not only to seize key military geography, but also to force a

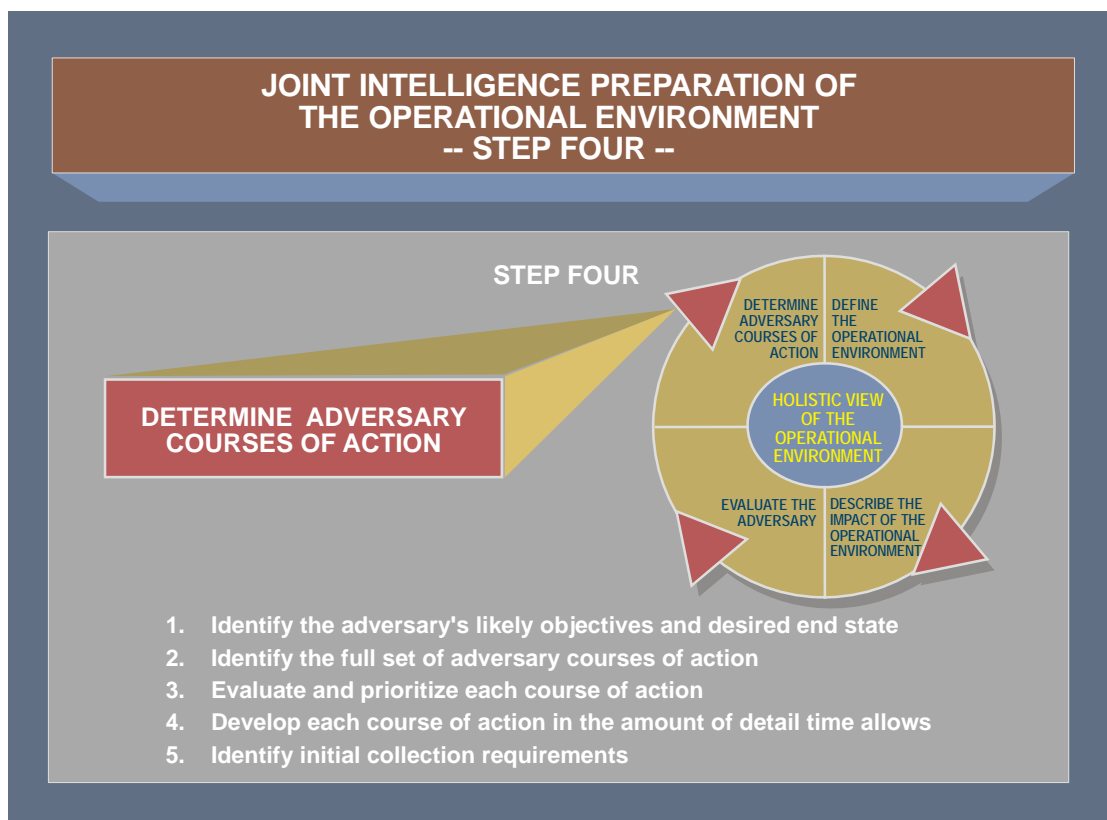


Figure II-29. Joint Intelligence Preparation of the Operational Environment – Step Four

situation in which US Pacific Fleet assets (especially aircraft carriers) could be decisively engaged and destroyed.

### 21. Identifying the Full Set of Adversary Courses of Action

During this step, a consolidated list of all potential adversary COAs is constructed. At a minimum this list will include all COAs that the adversary's doctrine or pattern of operations indicates are appropriate to the current situation and accomplishment of likely objectives; all adversary COAs that could significantly influence the friendly mission, even if the adversary's doctrine or pattern of operations indicates they are suboptimal under current conditions; and all adversary COAs indicated by recent activities or events.

*"Gentlemen, I notice that there are always three courses [of action] open to an enemy, and that he usually takes the fourth."*

**Field Marshal General Helmuth von Moltke the Elder  
Chief of the German General Staff  
(1857-1888)**

a. Each identified COA should meet the following five criteria:

(1) **Suitability.** An adversary COA must have the potential to accomplish the adversary's likely objective or desired end state.

(2) **Feasibility.** The adversary must have sufficient time, space, and resources to successfully execute the COA. However, a COA should not be assessed as unfeasible until all actions the adversary may take to overcome resource shortfalls are considered. For example, an adversary may make up for insufficient force ratios by conducting an economy of force operation in another sector. Always try to anticipate innovative or seemingly radical measures the adversary may adopt.

(3) **Acceptability.** The amount of risk associated with the COA should not exceed the level of risk acceptable to the adversary. The JIPOE analyst should determine the adversary's level of risk acceptance by analyzing past adversary military activity, current OB factors, and the psychological profiles of adversary leaders. In some instances, however, an opponent may be willing to tolerate a higher level of risk than normal, particularly if a risky COA is the only means of accomplishing the objective. The increasing use of suicide attacks by terrorists and the proliferation of WMD illustrate the increased levels of risk now acceptable to potential adversaries.

(4) **Uniqueness.** Each adversary COA must be significantly different from the others; otherwise it should be considered a variation rather than a distinct COA. Factors contributing to the uniqueness of a COA may include its effect on the friendly COA, use of reserves, location of the main effort, scheme of maneuver, or task organization.

(5) **Consistency with Adversary Doctrine or Patterns of Operation.** The COA should be consistent with the adversary's doctrine, TTP, and observed practices.

However, caution should be taken to guard against an adversary's attempt to achieve surprise by deliberately deviating from known doctrine or previously observed practices. Additionally, the availability of new technology or desperation may also drive an adversary to deviate from past doctrine or previous patterns of operation. The challenge to the JIPOE analyst is to anticipate such changes.

b. The consolidated list of adversary COAs is compared with the evaluation of adversary capabilities developed during step three of the JIPOE process. Any COA that the adversary is not capable of executing is eliminated from the list. However, caution must be taken when eliminating adversary COAs from consideration. The JIPOE analyst must have a high degree of confidence that the adversary truly lacks the means of adopting such COAs, and is incapable of innovation or a change in TTP that may make such a COA feasible.

c. The adversary templates (created during JIPOE step three) associated with each of the remaining COAs are analyzed relative to the impact of the operational environment (described during JIPOE step two). The JIPOE analyst will assess how the operational environment may constrain or modify the actual implementation of the adversary models for each COA. Usually the operational environment will either help or hinder the application of an adversary's doctrine or previous patterns of operation, thereby further delimiting the number of "feasible" COAs.

d. Each of the remaining broad COAs are refined into more specific COAs by adding details such as the timing or phasing of operations and the location of the adversary's main and supporting efforts.

e. All factors that may lead the adversary to adopt "wildcard" COAs should be considered. These factors may include:

- (1) The adversary's perception of friendly force capabilities, vulnerabilities, dispositions, and intentions;
- (2) An unsophisticated understanding of military art and science;
- (3) Immature decision-making processes;
- (4) The relative importance of "other characteristics of the operational environment" (especially politics); and
- (5) Desperation.

## 22. Evaluating and Prioritizing Each Course of Action

The full set of identified adversary COAs are evaluated and ranked according to their likely order of adoption. The purpose of the prioritized list of adversary COAs is to provide JFCs and their staffs with a starting point for the development of a plan or order

that takes into consideration the most likely adversary COA as well as the adversary COA most dangerous to the friendly force or mission accomplishment.

a. Caution should be exercised to remember that these COAs are only estimates of an adversary's intentions, not facts. It should also be kept in mind that actions associated with a friendly COA may cause the adversary to change to a different COA than the one originally adopted. Therefore, the adversary's reaction to changes in friendly force dispositions should be continuously analyzed to determine if the adversary has changed to a different COA. This, in turn, may require a reprioritization of the initial list of adversary COAs and result in the joint force staff developing branch plans.

b. The JIPOE analyst must also be constantly on guard against possible adversary deception efforts. The adversary may deliberately adopt a less than optimum COA in order to maximize surprise. Additionally, the adversary may gradually increase preparations for a specific COA over a lengthy period of time, thereby "psychologically conditioning" the JIPOE analyst to accept a level and type of adversary activity, previously considered to be abnormal, as a new norm.

c. The following procedures should be used when prioritizing adversary COAs:

(1) Analyze each COA to identify its strengths and weaknesses, COGs, and decisive points.

(2) Evaluate how well each COA meets the criteria of suitability, feasibility, acceptability, uniqueness, and consistency with doctrine. The JIPOE analyst should avoid cultural bias by considering these criteria in the context of the adversary's culture.

(3) Evaluate how well each COA takes advantage of the operational environment.

(4) Compare each COA and determine which one offers the greatest advantages while minimizing risk.

(5) Consider the possibility that the adversary may choose the second or third most likely COA while attempting a deception operation portraying adoption of the best COA.

(6) Analyze the adversary's current dispositions and recent activity to determine if there are indications that one COA has already been adopted.

(7) Guard against being "psychologically conditioned" to accept abnormal levels and types of adversary activity as normal. Identify and focus in greater detail on those adversary preparations not yet completed that are, nevertheless, mission essential to accomplish a specific COA.

### 23. Developing Each Course of Action in the Amount of Detail that Time Allows

Subject to the amount of time available for analysis, each adversary COA is developed in sufficient detail to describe: the type of military operation; the earliest time military action could commence; the location of the action, and the objectives that make up the COA; the OPLAN, to include scheme of maneuver and force dispositions; and the objective or desired end state. Each COA should be developed in the order of its probability of adoption, and should consist of a situation template, a description of the COA, and a listing of HVTs.

a. **Situation Template.** Situation templates are graphic depictions of expected adversary force dispositions at a specific time and place relative to an individual COA. As such, they represent “snapshots in time” of how the adversary will array and maneuver military forces based on doctrine and the characteristics of the operational environment. Depending on its complexity, an adversary COA may be depicted by a single situation template (usually depicting the most critical point of the adversary’s operation) or a series of situation templates depicting points where the adversary might adopt branches or sequels to the main COA. A systems perspective situation template should be constructed by comparing the consolidated systems overlay with the modified association matrix that depicts anticipated network changes for specific COAs. Situation templates are designed to facilitate wargaming by the JFC and joint force staff. The following techniques (see Figure II-30) should be used when constructing situation templates:

(1) **Geospatial Perspective.** To construct a situation template relative to the physical aspects of the operational environment, select the adversary template representative of the COA under consideration. Overlay the adversary template on the MCOO or other products that depict the impact of the operational environment on the operation. Based on the adversary’s preferred tactics, adjust the dispositions portrayed on the adversary template to account for the impact of the operational environment. Check the situation template to ensure that all the adversary’s major assets are accounted for and that none have been inadvertently duplicated. Ensure that the situation template depicts the locations and activities of all the HVTs listed in the adversary model. Analyze and wargame the adversary’s likely scheme of maneuver from current dispositions to the objective. Identify how each of the adversary’s force components fits in and supports the scheme of maneuver. Based on adversary movement doctrine, patterns, and capabilities as well as time and space factors, time phase lines should be placed on the situation template to depict the expected progress of adversary force movements. Modify time phase lines as necessary based on the anticipated effects of friendly military action and the current situation on adversary force movement capabilities (see Figure II-31).



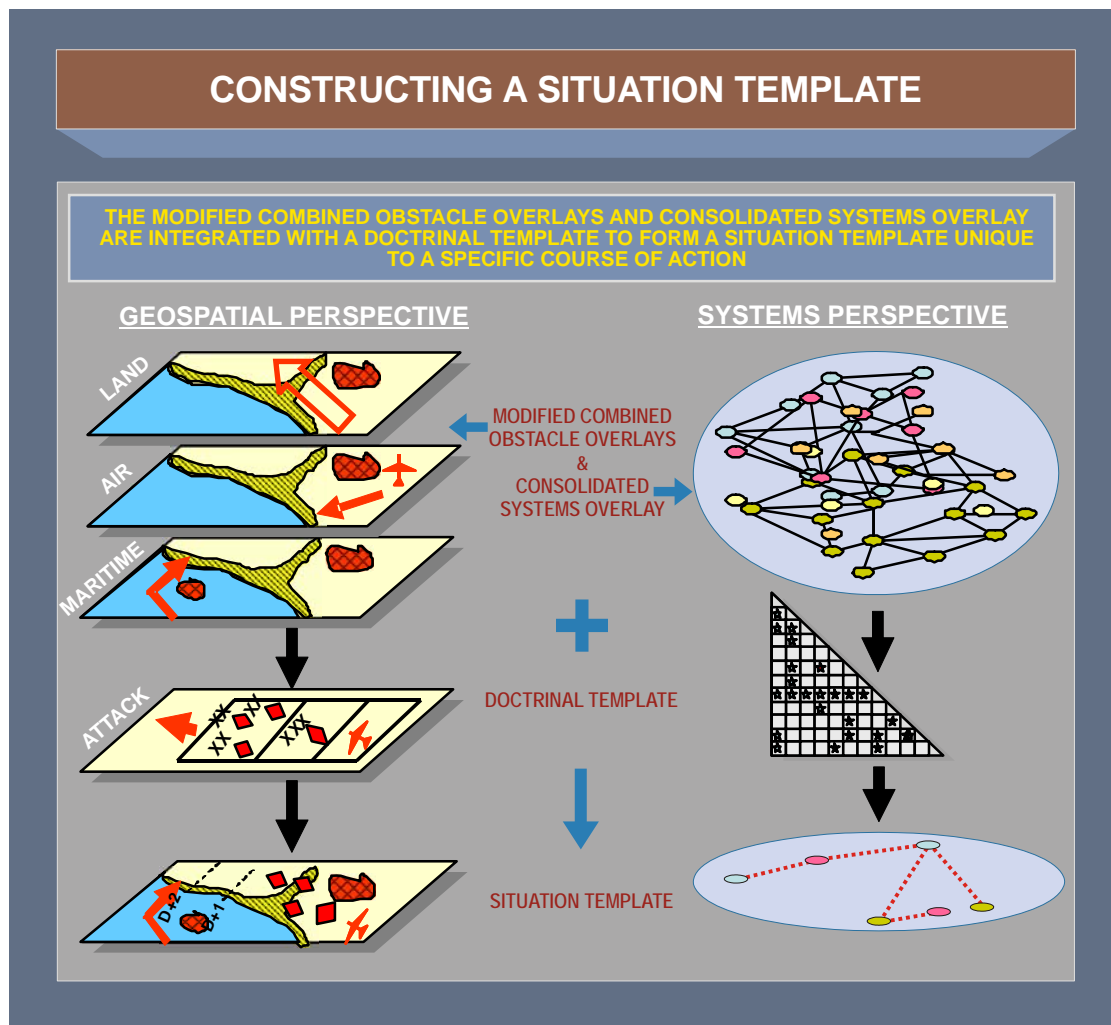


Figure II-30. Constructing a Situation Template

(2) **Systems Perspective.** To construct a situation template relative to a systems perspective, select the adversary template (modified association matrix) appropriate to the COA under consideration. Plot the anticipated node-link changes from the adversary template on an overlay extracted from an appropriate portion of the consolidated network diagram. The anticipated changes (new or modified links) should be distinguished by dotted lines (or other locally established symbology) color coded for each individual COA. The resulting systems situation template is essentially a simplified snapshot of the future depicting the node-link network changes associated with a specific COA (see Figure II-32). Appendix B, "Somalia 1992-1993 – A Case Study of Support to Irregular Warfare and Stability Operations," provides a description and historical example of the process for constructing systems situation templates.

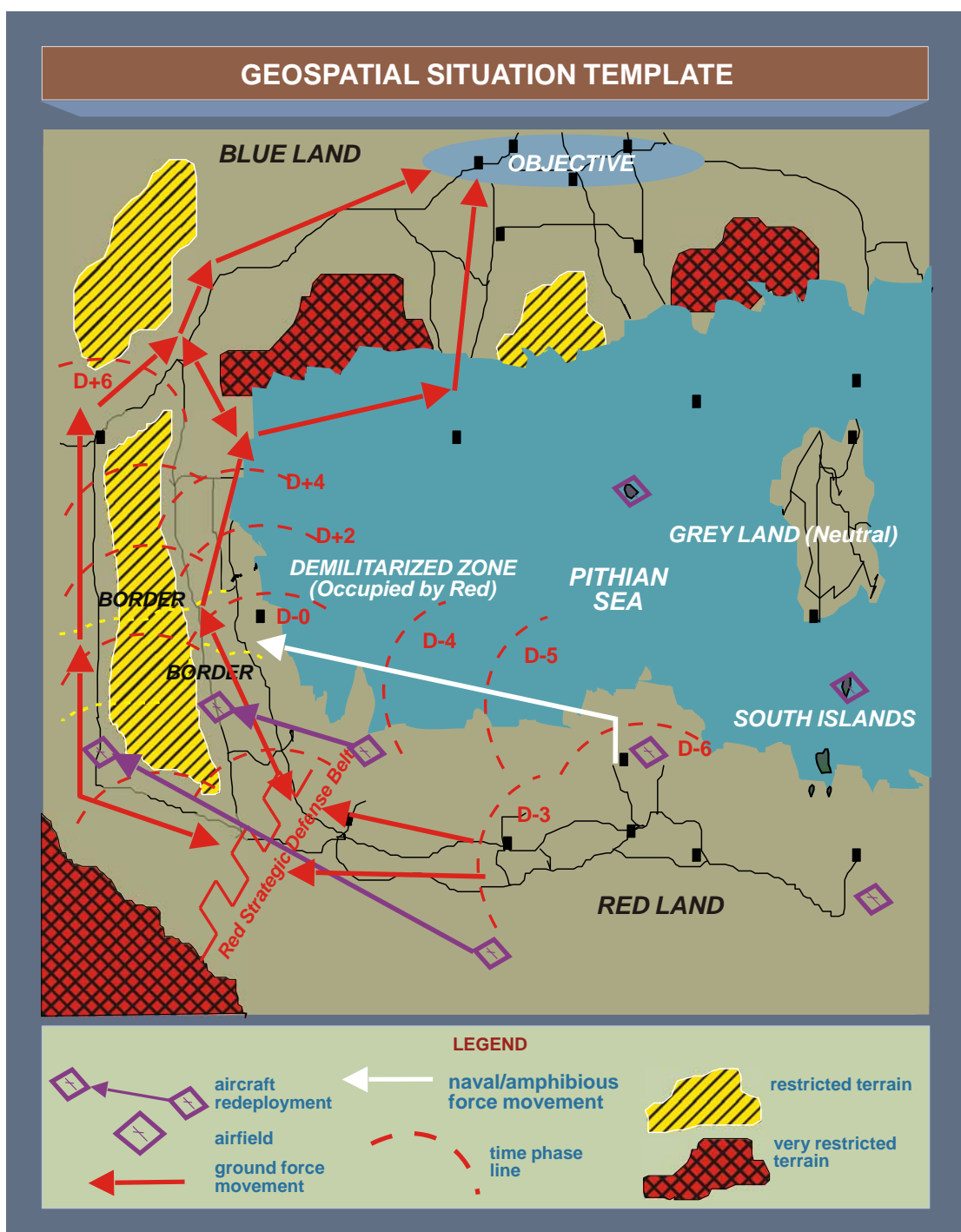


Figure II-31. Geospatial Situation Template

(3) Based on the relative complexity of some types of joint operations, some adversary COAs may be better presented in a matrix vice overlay format. A situation matrix may be particularly useful in depicting the phasing of the supporting operations conducted by each of the adversary's force components (see Figure II-33).

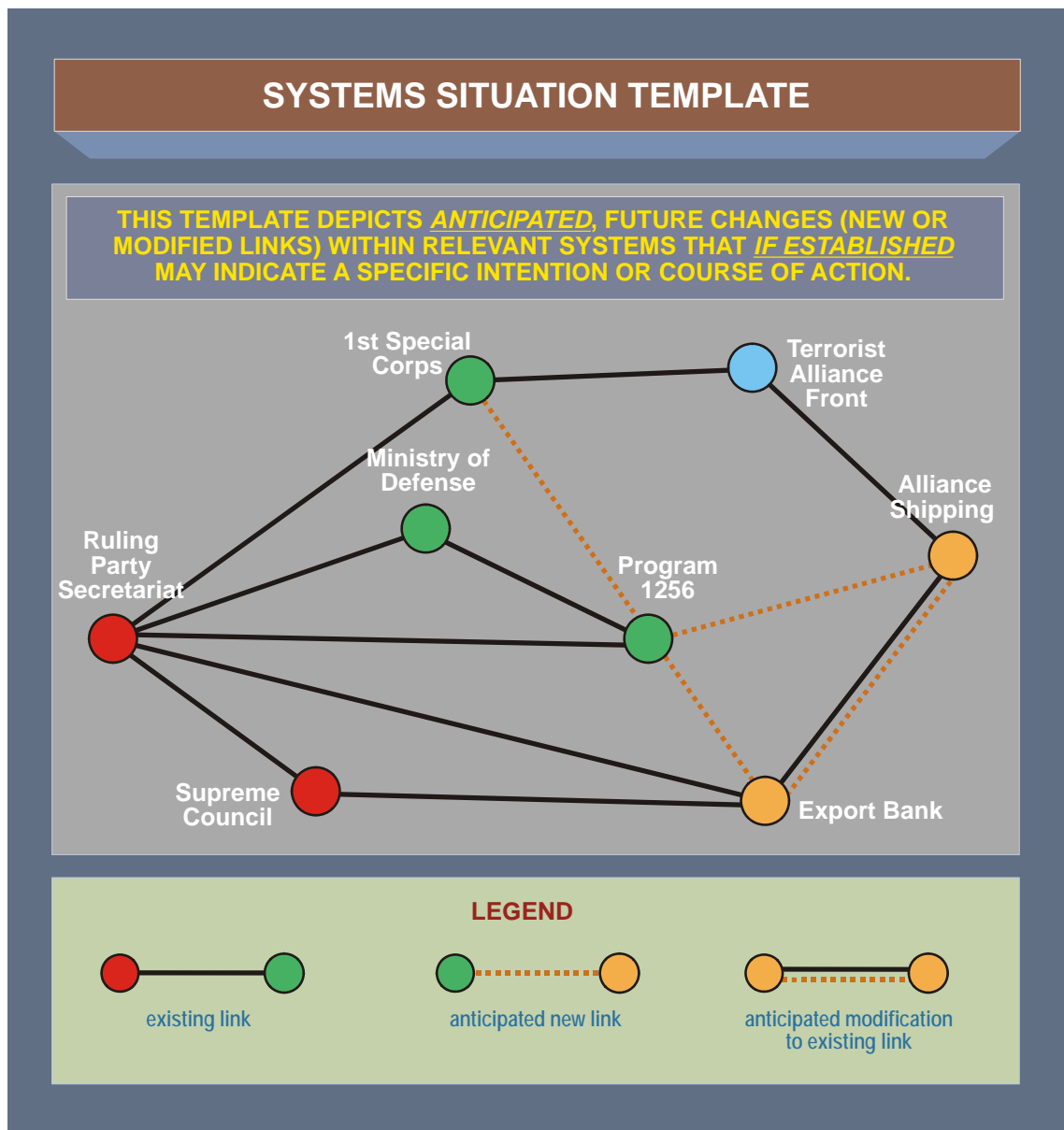


Figure II-32. Systems Situation Template

**b. COA Description.** Each COA must include a description of the expected activities of the adversary forces depicted on the situation template. This will usually consist of a narrative description that addresses the earliest time the COA can be executed, location of the main effort, supporting operations, and time and phase lines associated with the COA. Critical decisions that the adversary commander must make during the implementation of the COA are described in terms of their location in time and space (decision points) and all relative decision-making criteria.

**c. High-Value Targets.** The decisive points identified during COG analysis, and the HVTs listed on the doctrinal templates associated with each COA, should be refined and reevaluated. The relative worth of each HVT will vary with the specific situation under consideration and over the duration of the COA's execution. Each COA should be

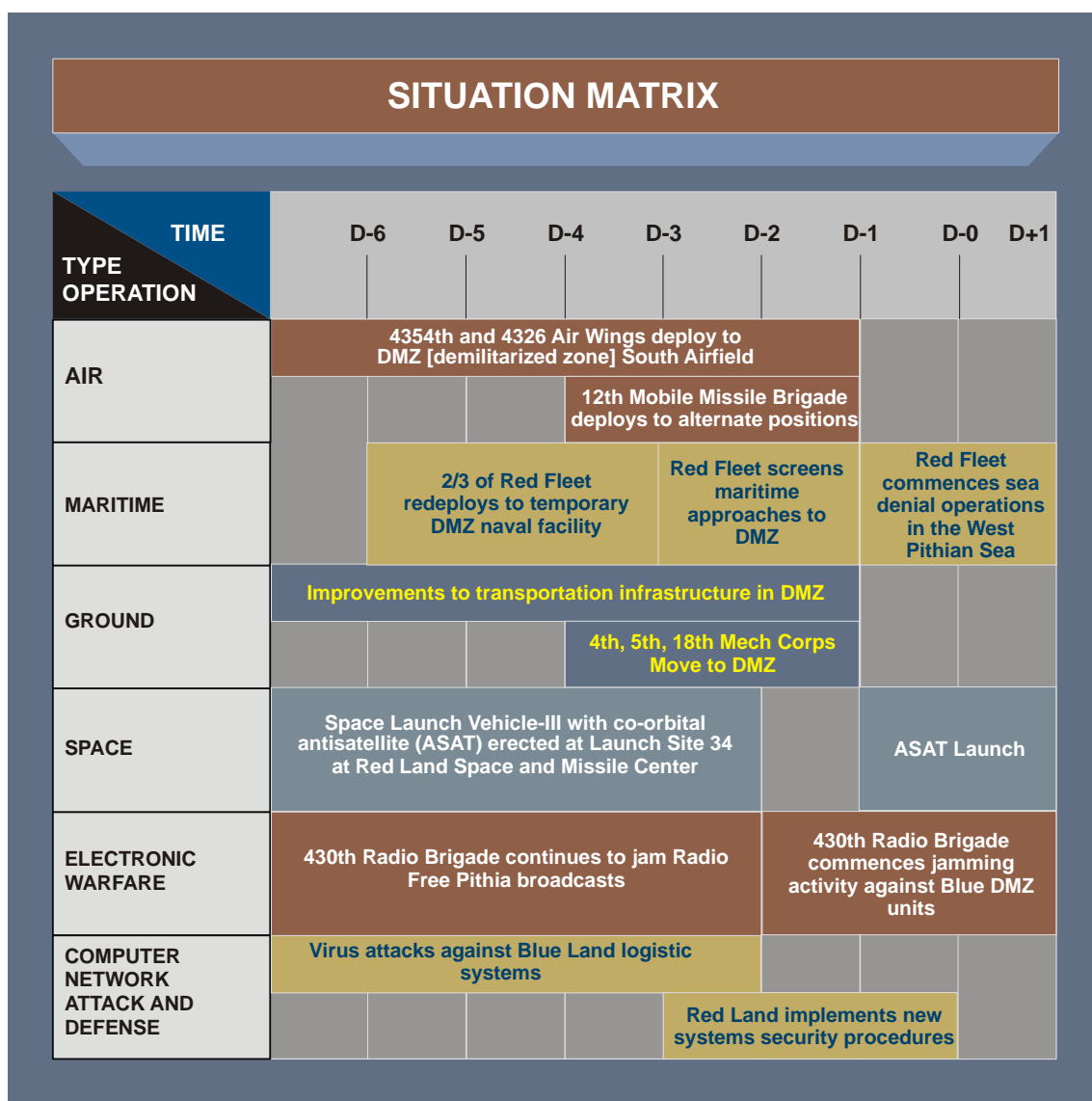


Figure II-33. Situation Matrix

mentally wargamed to determine potential deployment locations for each HVT, and the point in time when each target is most valuable to the COA's success. Those areas where the adversary is most likely to deploy HVTs at the time when they are most crucial to the adversary's operation should be identified and passed to the joint force's targeting element. These areas should be designated as target areas of interest (TAIs) and can be annotated on the situation template or maintained on a separate list and overlay.

## 24. Identifying Initial Collection Requirements

The identification of initial intelligence collection requirements depends on the prediction of specific activities and the areas in which they are expected to occur which, when observed, will reveal which COA the adversary has adopted. The areas in which these activities or indicators are expected to take place are designated as named areas of

interest (NAIs). The NAIs and their associated indicators are depicted on the event template and event matrix.

a. The Event Template. The event template is developed by comparing the analyses depicted on the situation templates for each of the COAs that the adversary is capable of executing (see Figure II-34). The purpose of this comparison is to identify those NAIs that are unique to the adoption of a specific adversary COA or a limited set of COAs. Conversely, those areas and activities that are common to all COAs are eliminated from consideration because they are not useful in differentiating the adoption of one COA over another. The NAIs for all the adversary's COAs are consolidated and depicted on the event template. An NAI can be a specific point, route, area, or network node or link and can match obvious geographic features or arbitrary features such as timed phase lines or engagement areas. They should be large enough to encompass the geospatial activity or network link that serves as the indicator of the adversary's COA (see Figure II-35). Appendix B, "Somalia 1992-1993 – A Case Study of Support to Irregular Warfare and Stability Operations," provides a description and historical example of the process for constructing a systems event template.

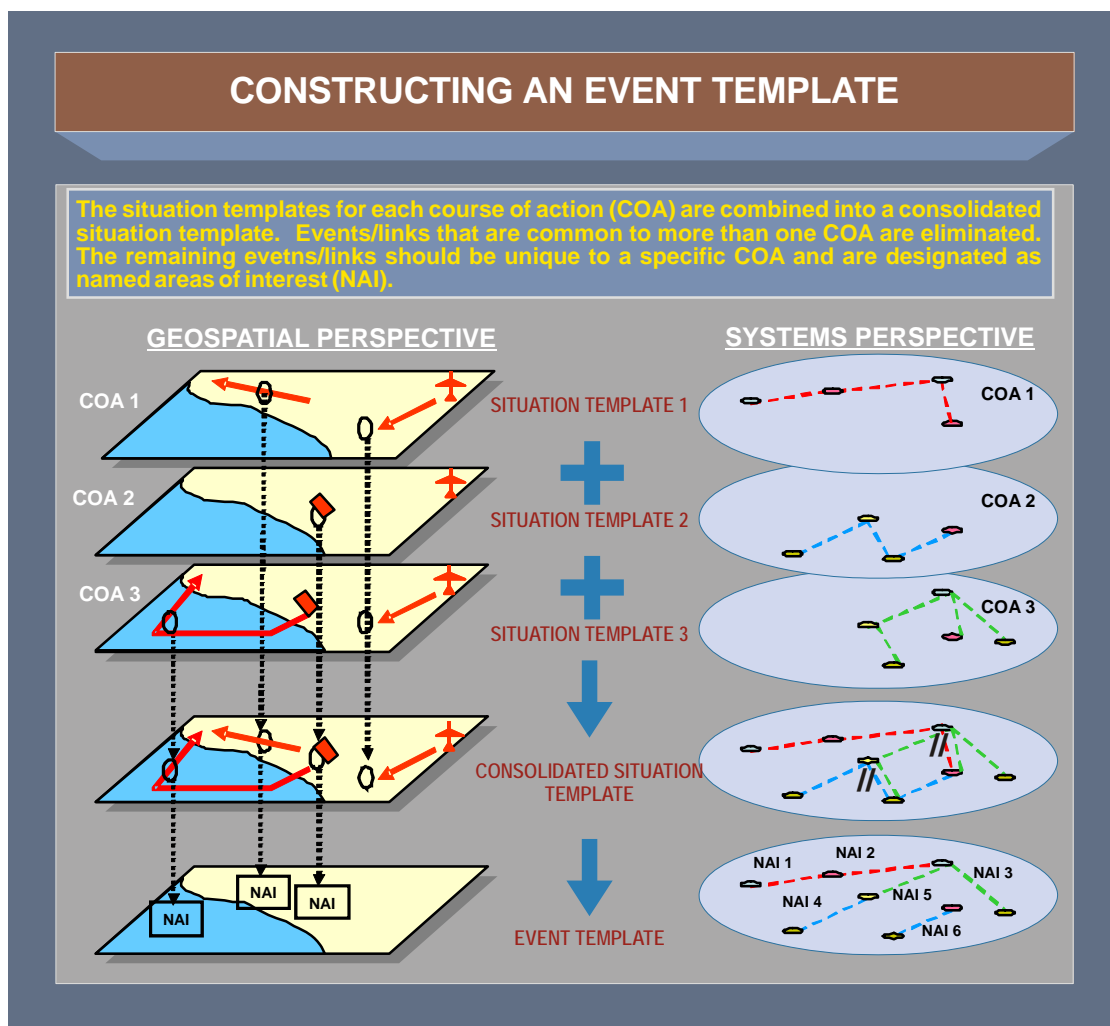


Figure II-34. Constructing an Event Template



Figure II-35. Event Template

b. The Event Matrix. The event matrix supports the event template by providing details on the type of activity expected in each NAI, the times the activity is expected to occur, and the COAs with which the activity is associated. Although the primary purpose

of the event matrix is to facilitate intelligence collection planning, it can also serve as a useful aid in situation development and wargaming (see Figure II-36 and Figure II-37).

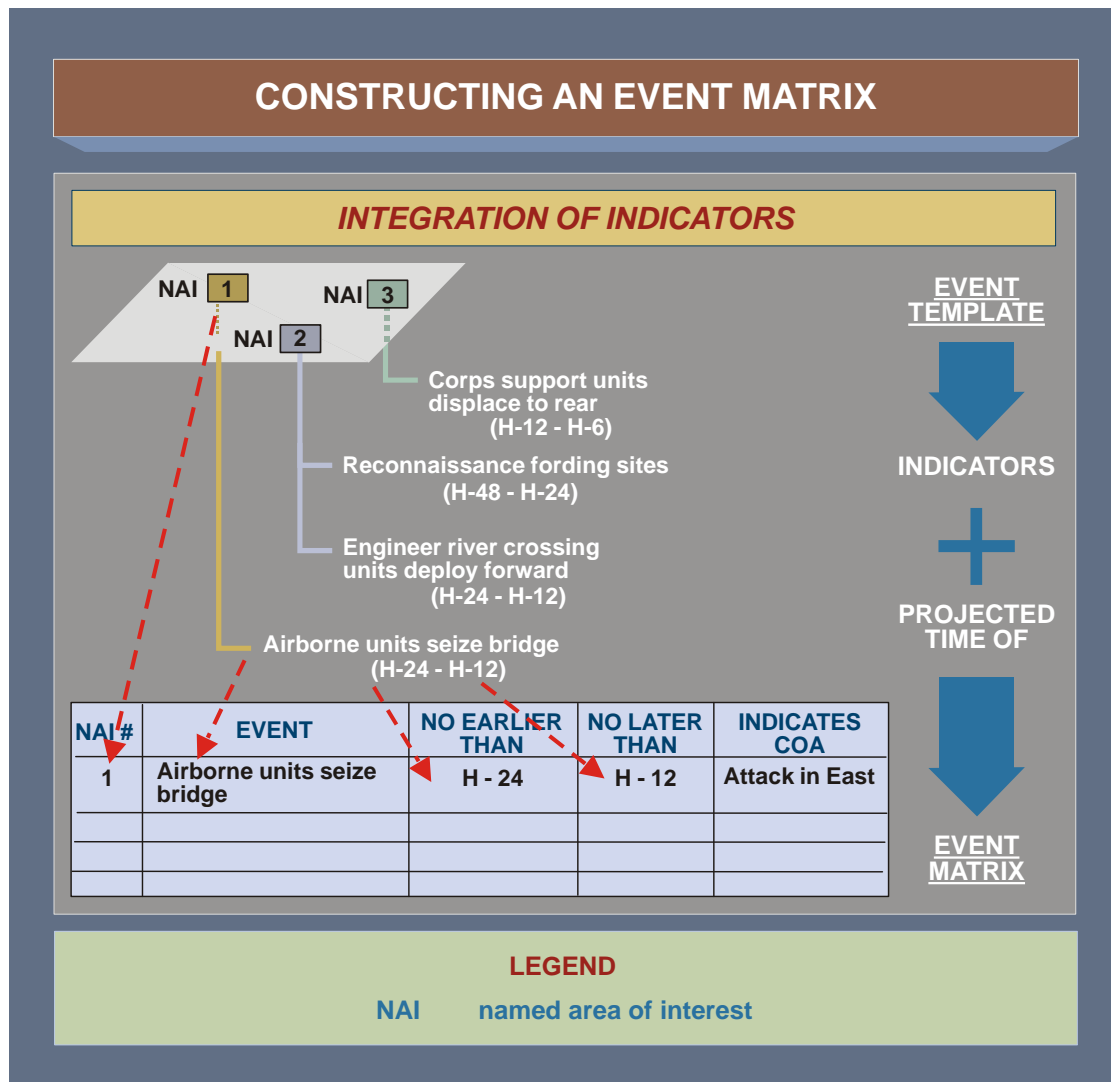


Figure II-36. Constructing an Event Matrix



EVENT MATRIX				
NAI	EVENT	TIME		INDICATE COA
		Earliest	Latest	
1	Laying of minefields and construction of obstacles in depth in the demilitarized zone (DMZ).	D-10	D-0	Defend
2	Improvements to transportation infrastructure in northern DMZ.	D-10	D-1	Attack (in West)
3	Presence of additional surface combatants and minelayers at DMZ port.	D-7	D-3	Reinforce
4	Deployment of additional combat aircraft at forward airfield.	D-7	D-1	Reinforce
5	Northward movement of red corps size force.	D-3	D-1	Attack (in West)
6	Northward movement of two more corps.	D-3	D-1	Attack (in West)
7	Occupation of red strategic defense belt by second echelon units.	D-2	D-1	Retrograde
8	Presence of red surface combatants and minelayers.	D-3	D-1	Retrograde
9	Deployment of additional combat aircraft near red strategic defense belt.	D-7	D-1	Retrograde
10	Departure of mobile missile units from garrison and local dispersal areas.	D-3	D-1	Attack
11	Concentration of additional aircraft at rear airfield.	D-2	D-1	Defend
12	Presence of intermediate-range ballistic missiles on or near launch pad.	D-3	D-1	Attack
13	Departure of surface combatants and amphibious support ships from port.	D-6	D-4	Attack
14	Concentration of additional combat aircraft.	D-2	D-1	Defend
15	Northward transit of amphibious task force.	D-6	D-3	Attack (in Center)
16	Eastward transit of amphibious task force.	D-6	D-4	Attack (in East)
17	Deployment of additional combat aircraft.	D-3	D-1	Attack (in East)
18	Deployment of additional combat aircraft.	D-3	D-1	Attack (in Center)
19	Northward transit of amphibious task force.	D-5	D-3	Attack (in East)

Figure II-37. Event Matrix

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## CHAPTER III

### SUPPORT TO JOINT OPERATION PLANNING, EXECUTION, AND ASSESSMENT

*“A general should say to himself many times a day: ‘If the hostile army were to make its appearance to my front, on my right, or on my left, what would I do?’ And if he is embarrassed, his arrangements are bad; there is something wrong; he must rectify his mistake.”*

**Napoleon Bonaparte**  
1769-1821

#### 1. Introduction

The primary purpose of JIPOE is to support joint operation planning, execution, and assessment by identifying, analyzing, and assessing the adversary’s COGs, critical vulnerabilities, capabilities, decisive points, limitations, intentions, COAs, and reactions to friendly operations based on a holistic view of the operational environment. JIPOE analysis assists the JFC and joint force staff to visualize and understand the full range of adversary capabilities and intentions. JIPOE analysts identify, describe, and compare the opposing advantages and disadvantages of all relevant aspects of the operational environment, and assist in determining how to gain strategic or operational advantage and initiative over the adversary. Although JIPOE support is both dynamic and continuous, it must also be “front loaded” in the sense that the bulk of JIPOE analysis must be completed early enough to be factored into the JFC’s decision-making effort. Furthermore, prepared or “on the shelf” JIPOE products will provide the foundation on which JIPOE support in a time-constrained environment is based. JFCs and their staffs are responsible for ensuring that all JIPOE products and analyses are fully integrated into the joint force’s operation planning, execution, and assessment efforts.

#### SECTION A. PLANNING

#### 2. Overview

JIPOE supports joint operation planning by identifying significant facts and assumptions about the operational environment. This information includes details regarding adversary critical vulnerabilities, capabilities, decisive points, limitations, COGs, and potential COAs. JIPOE products are used by the JFC to produce the commander’s estimate of the situation and CONOPS, and by the joint force staff to produce their respective staff estimates. Various intelligence products such as DIA-produced dynamic threat assessments (DTAs), baseline JIPOE products, and other locally produced assessments, will contribute to developing and enhancing comprehensive intelligence estimates. JIPOE products also help to provide the framework used by the joint force staff to develop, wargame, and compare friendly COAs and provide a foundation for the JFC’s decision regarding which friendly COA to adopt. JIPOE support is crucial throughout the steps of the joint operation planning process (JOPP) (see Figure III-1).

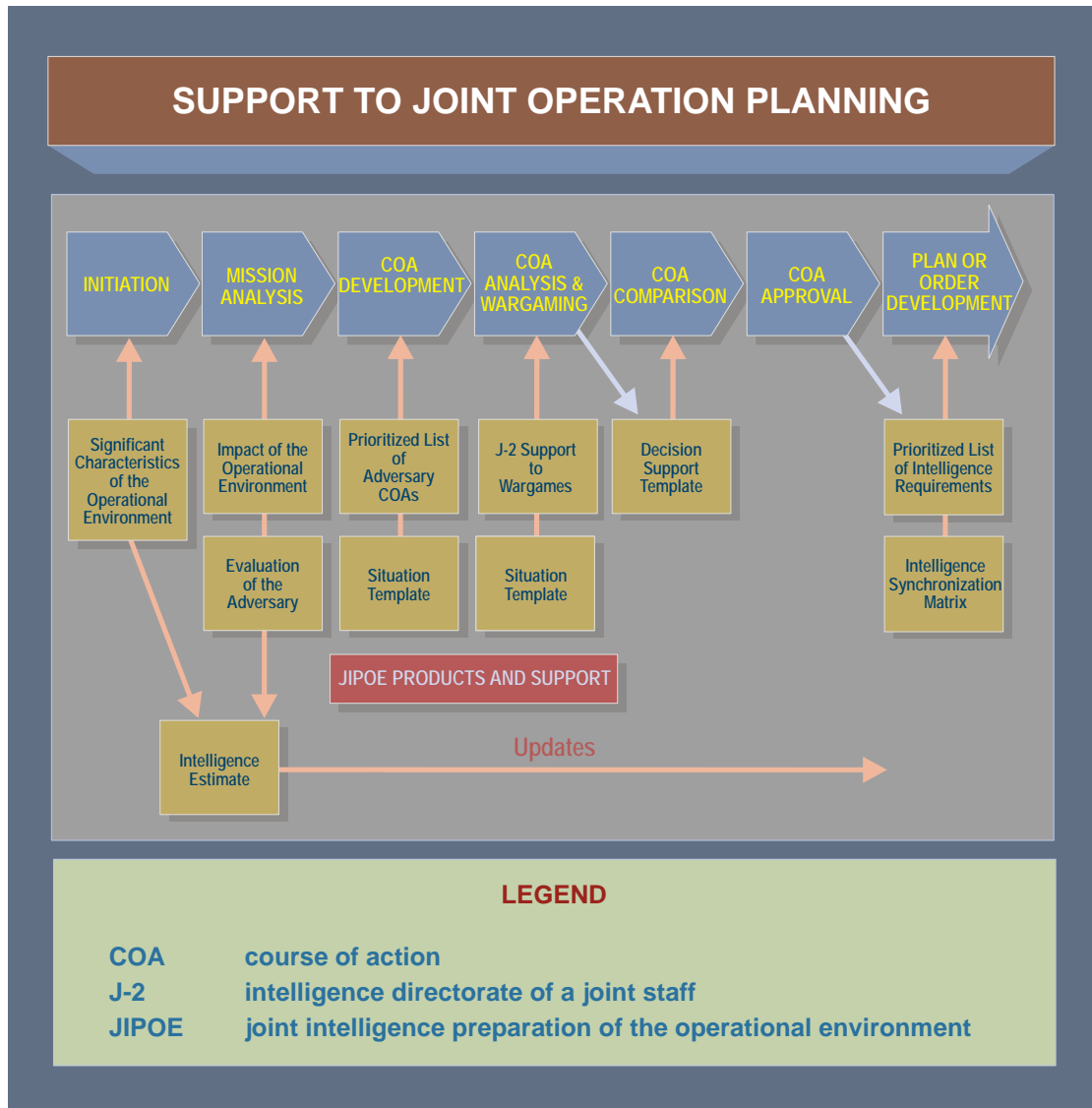


Figure III-1. Support to Joint Operation Planning

a. The JIPOE effort should facilitate parallel planning by all strategic, operational, and tactical units involved in the operation. JIPOE products developed to support strategic-level planning should also be simultaneously disseminated to all appropriate operational and tactical headquarters. This is especially true during initial planning periods when headquarters at intermediate echelons may tend to filter information as it travels down to tactical units.

b. The integration of Service component IPB products with the JFCs' JIPOE effort creates a synergy in which an adversary's COAs may provide indicators as to the adversary's overall capabilities, intentions, desired end state, and strategy. Specifically, JIPOE products facilitate operation planning by determining the following:

(1) The idiosyncrasies and decision-making patterns of the adversary strategic leadership and field commanders.

(2) The adversary's strategy, intention, or strategic concept of operations, which should include the adversary's desired end state, perception of friendly vulnerabilities, and adversary intentions regarding those vulnerabilities.

(3) The composition, dispositions, movements, strengths, doctrine, tactics, training, and combat effectiveness of major adversary forces that can influence friendly actions in the theater and operational areas.

(4) The adversary's principal strategic and operational objectives and lines of operation.

(5) The adversary's strategic and operational sustainment capabilities.

(6) COGs and decisive points throughout the adversary's operational and strategic depths.

(7) The adversary's ability to conduct IO and use or access data from all systems.

(8) The adversary's regional strategic vulnerabilities.

(9) The adversary's capability to conduct asymmetric attacks against friendly global critical support nodes (e.g., electric power grids, oil and gas pipelines, pre-positioned supply depots).

#### **THE NEED FOR JOINT INTELLIGENCE PREPARATION OF THE OPERATIONAL ENVIRONMENT TO SUPPORT PARALLEL PLANNING**

**Parallel planning implies concurrent planning and simultaneous coordination among planners from the strategic to the tactical levels. [During Operation RESTORE HOPE], early parallel planning...would have provided access to the strategic aspects of intelligence related to preparation of the battlefield. The information needed by subordinate commanders includes more than classical intelligence data. The operational commander needs a synthesis of data from all...operating systems for his own use and for analysis by the planning staff. This information should not be filtered out between headquarters. It should be flashed to the operational and tactical headquarters simultaneously to facilitate detailed planning at all levels.**

**SOURCE: Major General S.L. Arnold, US Army,  
Commander 10th Mountain Division,  
Army Forces Commander during Operation HURRICANE ANDREW and  
Operation RESTORE HOPE,  
PARAMETERS, Winter 93-94.**

(10) The adversary's relationship with possible allies and the ability to enlist their support.

(11) The adversary's defensive and offensive vulnerabilities in depth.

(12) The adversary's capability to operate advanced warfighting systems (e.g., smart weapons and sensors) in adverse METOC conditions.

(13) Key nodes, links, and exploitable vulnerabilities within an adversary system.

### 3. Initiation

a. JOPP begins when an appropriate authority recognizes a potential for military capability to be employed in response to a potential or actual crisis. At the strategic level, that authority — the President, Secretary of Defense, or the Chairman of the Joint Chiefs of Staff (CJCS) — initiates planning by deciding to develop military options. The Joint Strategic Capabilities Plan, and related strategic guidance statements (when applicable) serve as the primary guidance to begin contingency planning. However, CCDRs and other commanders may initiate planning on their own authority when they identify a planning requirement not directed by higher authority. Military options normally are developed in combination with other nonmilitary options so that the President can respond with all the appropriate instruments of national power. The JFC typically will provide **initial guidance** (not to be confused with the JFC's planning guidance that is a product of mission analysis), which could specify time constraints, outline initial coordination requirements, authorize movement of key capabilities within the JFC's authority, and direct other actions as necessary.

b. A preliminary or abbreviated JIPOE analysis pertaining to potential contingencies and significant characteristics of the operational environment should precede and inform the initiation phase of joint operation planning. During the initiation phase, DIA produces a DTA for each top priority plan identified in the *Guidance for Employment of the Force* and continuously updates each DTA as relevant aspects of the operational environment change. Combatant command intelligence analysts accelerate JIPOE step one activities by continuously monitoring the situation, alerting the JFC and staff to developments that may impact the operation planning effort, updating existing JIPOE products, and initiating new intelligence collection or production requirements. Additionally, the JFC may decide to form a JIPOE coordination cell to coordinate support and help analyze the initiating directive to determine time available until mission execution, the current status of JIPOE products and related staff estimates, and other factors relevant to the specific planning situation.

### 4. Mission Analysis

In order for the joint force staff to identify potential COAs, the JFC must formulate planning guidance based on an analysis of the friendly mission. This analysis helps to

identify specified, implied, and essential tasks, any constraints on the application of military force, the JFC's task and purpose (restated mission), and possible follow-on missions. JIPOE supports mission analysis by enabling the JFC and joint force staff to visualize the full extent of the operational environment, to distinguish the known from the unknown, and to establish working assumptions regarding how adversary and friendly forces will interact within the constraints of the operational environment. JIPOE assists JFCs in formulating their planning guidance by identifying significant adversary capabilities and by pointing out critical factors, such as the locations of key geography, attitudes of indigenous populations, and potential land, air, and sea avenues of approach. Mission analysis and JFC guidance form the basis for the subsequent development of friendly COAs by the joint force staff. It is therefore imperative that an initial version of the impact of the operational environment, evaluation of the adversary and adversary COAs be briefed to the JFC at the mission analysis briefing. This is critical to enabling the JFC to provide sufficient guidance for friendly COA development.

## **5. Course of Action Development**

The J-3 and J-5 develop friendly COAs designed to accomplish the joint force's mission within the guidelines established by the JFC. In developing friendly COAs, the J-3 and J-5 take into consideration factors such as relative force ratios, initial force dispositions, and possible schemes of maneuver. The number of friendly COAs developed should remain manageable while still addressing each adversary COA. The J-2 facilitates this process by ensuring that all adversary COAs are identified, evaluated, and prioritized (JIPOE step four) in sufficient time to be integrated into the friendly COA development effort. Additionally, the evaluation of the adversary (JIPOE step three) is used by the J-3 and J-5 to estimate force ratios. The process of estimating force ratios may be complicated due to wide disparities between friendly and adversary unit organization, equipment capabilities, training, and morale. In such situations, the J-2, J-3, and J-5 may choose to develop local techniques and procedures for evaluating adversary units and equipment in terms of friendly force equivalents. The J-3 also depends heavily on JIPOE products prepared during the analysis of the adversary situation and the evaluation of other relevant aspects of the operational environment in order to formulate initial friendly force dispositions and schemes of maneuver. Additionally, the JIPOE analysis of HVTs is used by the J-3 and J-5 to identify targets whose loss to the adversary would significantly contribute to the success of a friendly COA. These targets are refined through wargaming and are designated as HPTs. JIPOE also provides significant input to the formulation of deception plans by analyzing adversary intelligence collection capabilities and the perceptual biases of adversary decision makers.

## **6. Course of Action Analysis and Wargaming**

All joint force staff sections participate in an analysis of the friendly COAs developed by the J-3 and J-5. The purpose of this effort is to identify any aspects of a particular COA that would make it infeasible, and to determine which COA best



accomplishes the joint force's mission. The best method of analyzing friendly COAs is through wargaming and the construction of a decision support template.

a. **Wargaming.** Wargaming stimulates thought and provides insight into aspects of the friendly COA that might not otherwise have occurred. It is a conscious attempt to visualize the flow of a military operation, given friendly strengths and dispositions, adversary assets and possible COAs, and a specific operational environment. It forecasts how the neutralization of specific adversary targets will affect each friendly COA, thereby facilitating the analysis and identification of HPTs. Wargaming attempts to foresee the action, reaction, and counteraction dynamics between a pair of friendly and adversary COAs.

(1) **Preparation for the Wargame.** Wargaming depends to a significant degree on the amount of preparation put into the effort. The following procedures will help maximize the benefits of the wargame:

(a) The amount of time available for wargaming must be determined. If possible, sufficient time should be allocated to wargame each friendly COA against the complete set of all adversary COAs. If time constraints do not permit this, then each friendly COA must, at a minimum, be wargamed against the adversary's most likely COA and most dangerous COA.

(b) Time limits must be established for wargaming each part of the operation. If time limits are not established, the staff may spend too much time wargaming specific aspects of the operation at the expense of others.

(c) The J-2 must ensure that the adversary situation, force dispositions, analysis of HVTs, and adversary doctrinal templates are current prior to the start of wargaming.

(d) Assumptions regarding the operational environment and adversary must be realistic. Avoid constructing assumptions that are deliberately designed to support premature conclusions or conceptual bias that favors one COA over another. For example, the joint force staff must guard against seizing upon one adversary COA as a "given" simply because it fits preconceived notions or is a "convenient" match for an already favored friendly COA. Rather, the staff should plan to counter *all* adversary COAs identified during the JIPOE process. It is imperative that JFCs and their staffs recognize that the least likely adversary COA may be the one actually adopted precisely because it is the least likely, and therefore may be intended to maximize surprise.

(e) All known critical events that may require a decision should be identified. Critical events identified before the wargame are usually specified or implied tasks that are essential to mission accomplishment. Other critical events will become apparent during the wargame. The joint force staff should agree to explore and preplan decisions that the JFC might have to make during the operation.

(2) **Conduct of the Wargame.** The wargame should follow a sequence of “action — reaction — counteraction” in which the J-2, JIOC, or red team personnel play the roles of adversary commanders. The side taking the initiative will begin the process by describing the COA. The opposing side will interrupt, as appropriate, to describe their reaction. The initial force will then interrupt the opposition to describe their counteraction. Each interruption represents a decision that must be made by the friendly or adversary commander or staff during the actual execution of the COA. Some basic rules for successful wargaming include the following:

(a) Avoid comparing one COA with another during the wargame. The comparison of friendly COAs should wait until after all COAs have been wargamed.

(b) Each friendly COA should be wargamed first against the adversary’s most likely COA and then against the most dangerous adversary COA. The other adversary COAs should be wargamed in accordance with the JFC’s guidance.

(c) Ensure that each friendly COA remains feasible. If for any reason during the wargame a friendly COA is determined to be infeasible, the wargame should be stopped and that COA should be revised or rejected.

(d) Test the validity of candidate COGs. The defeat, destruction, neutralization, or substantial weakening of a valid COG should cause an adversary to change its COA or prevent an adversary from achieving its strategic objectives. If analysis shows that this does not occur, then perhaps JIPOE analysts have misidentified the COG, and they must revise their COG and critical factors analysis.

(e) Each interruption in the “action — reaction — counteraction” drill corresponds to a decision that would have to be made by the JFC or the joint force staff. Each time such a decision point is identified during the wargame, it should be recorded on the decision support template. Information required for the JFC to make identified decisions should be determined by the J-3/J-5 and J-2 during the context of wargaming. That information will later form the basis for either friendly force information requirements or PIRs and factored into the decision support template.

**b. Decision Support Template.** The decision support template (see Figure III-2) is essentially a combined intelligence estimate and operations estimate in graphic form. It relates the detail contained on the event template (prepared during JIPOE step four) to the times and locations of critical areas, events, and activities that would necessitate a command decision, such as shifting the location of the main effort or redeploying forces. Although the decision support template does not dictate decisions to the JFC, it is a useful tool for indicating points in time and space (decision points) where action by the JFC may be required. The decision support template is constructed by combining the event template with data developed during the wargame. The J-2, J-3, J-4, J-5, and J-6 collaborate in the production of the decision support template, which is fully coordinated with all joint force staff elements. The decision support template displays TAIs, avenues of approach, objectives, and time phase lines derived from the JIPOE event template.



Figure III-2. Decision Support Template

(1) **Target Areas of Interest.** Each of the TAIs identified during the fourth step of JIPOE are displayed on the decision support template. Each of these locations is associated with a corresponding decision point that, if activated, will confirm the adversary's intention to move into the TAI. This relationship is crucial and mirrors the relationship between intelligence and operations. Thus, intelligence collection against the

decision point is designed to provide the J-3 with the necessary tip-off information to engage the adversary force in the TAI.

(2) **Decision Points.** A decision point is a point in space and time when the commander or staff anticipates making a key decision concerning a specific course of action. A decision point should be located to provide sufficient time for friendly forces to engage the adversary in a specific TAI. The locations of decision points depend both on the availability and response time of friendly forces as well as the anticipated activity, capabilities, and movement rates of adversary forces. The J-2 will assist the J-3 and J-5 in identifying decision points that support the overall CONOPS. Both staff elements must work together to ensure that the distance between decision points and their associated TAIs permit sufficient time to synchronize friendly actions before the adversary reaches the engagement area. Specifically, the distance between a decision point and its associated TAI must permit sufficient time and space for:

(a) The collection of intelligence confirming that the anticipated adversary activity has occurred at the decision point;

(b) The processing and dissemination of this intelligence to the JFC;

(c) The preparation and movement of friendly forces to engage the adversary in the TAI; and

(d) The movement of the adversary from the decision point to the TAI.

## **7. Course of Action Comparison**

Following wargaming, the staff compares friendly COAs to identify the one that has the highest probability of success against the full set of adversary COAs as depicted on the decision support template. Each joint force staff section uses different criteria for comparing friendly COAs, according to their own staff area of expertise. For example, the J-3 and J-5 compare friendly COAs based on the friendly force's ability to defeat each adversary COA, whereas the J-2 assesses the overall capabilities of intelligence collection and production to support each friendly COA. Additionally, each staff section must ensure that they have fully considered the JFC's initial planning guidance for COA selection.

## **8. Course of Action Approval**

After comparing friendly COAs, each joint force staff element presents its findings to the remainder of the staff. Together they determine which friendly COA they will recommend to the JFC. The J-3 then briefs the COAs to the JFC using graphic aids, such as the decision support template and matrix. The JFC decides upon a COA and announces the CONOPS.

### 9. Plan or Order Development

Using the results of wargaming associated with the selected COA, the joint force staff prepares plans and orders that implement the JFC's decision. The J-2 prioritizes intelligence requirements and synchronizes intelligence collection requirements to support the COA selected by the JFC.

a. **Prioritization of Intelligence Requirements.** The J-2 uses the JFC's CONOPS and the results of the wargame to refine the initial set of intelligence requirements developed during step one of the JIPOE process. The J-2 should analyze the specific types of adversary activity that are expected to occur at each decision point. These indicators provide the basis for tailoring the list of intelligence requirements to support the COA selected by the JFC. The J-2 prioritizes the list of intelligence requirements and develops a synchronization matrix which reflects the collection, processing, and production of intelligence required to support the decision-making process.

b. **Synchronization of Intelligence Collection.** The J-2 must direct the intelligence collection effort, receive the information it produces, process it, and then produce and disseminate the relevant intelligence in time to support the JFC's decision-making requirements. The coordination of this entire process is known as intelligence synchronization. In order to collect and provide in a timely manner all the intelligence required to support the friendly COA, an intelligence synchronization matrix may be designed (see Figure III-3). The J-2 constructs the intelligence synchronization matrix by establishing intelligence collection deadlines for satisfying each intelligence requirement. The J-2 bases these deadlines on the decision-making timeline requirements of the JFC and the joint force's planning staff, also factoring in the time required to process, exploit, and disseminate the resulting information. The J-2 then develops a collection strategy for each intelligence requirement that will ensure it is answered on time. This collection strategy is depicted on the intelligence synchronization matrix. The collection strategy should consider:

- (1) Collection systems capabilities and availability at all levels: tactical, operational, strategic, and national;
- (2) Tasking timelines associated with each collection system or discipline;
- (3) Collection and processing timelines;
- (4) Exploitation timelines;
- (5) Dissemination timelines;
- (6) Type of target or activity collected against;
- (7) Location of the NAI collected against;

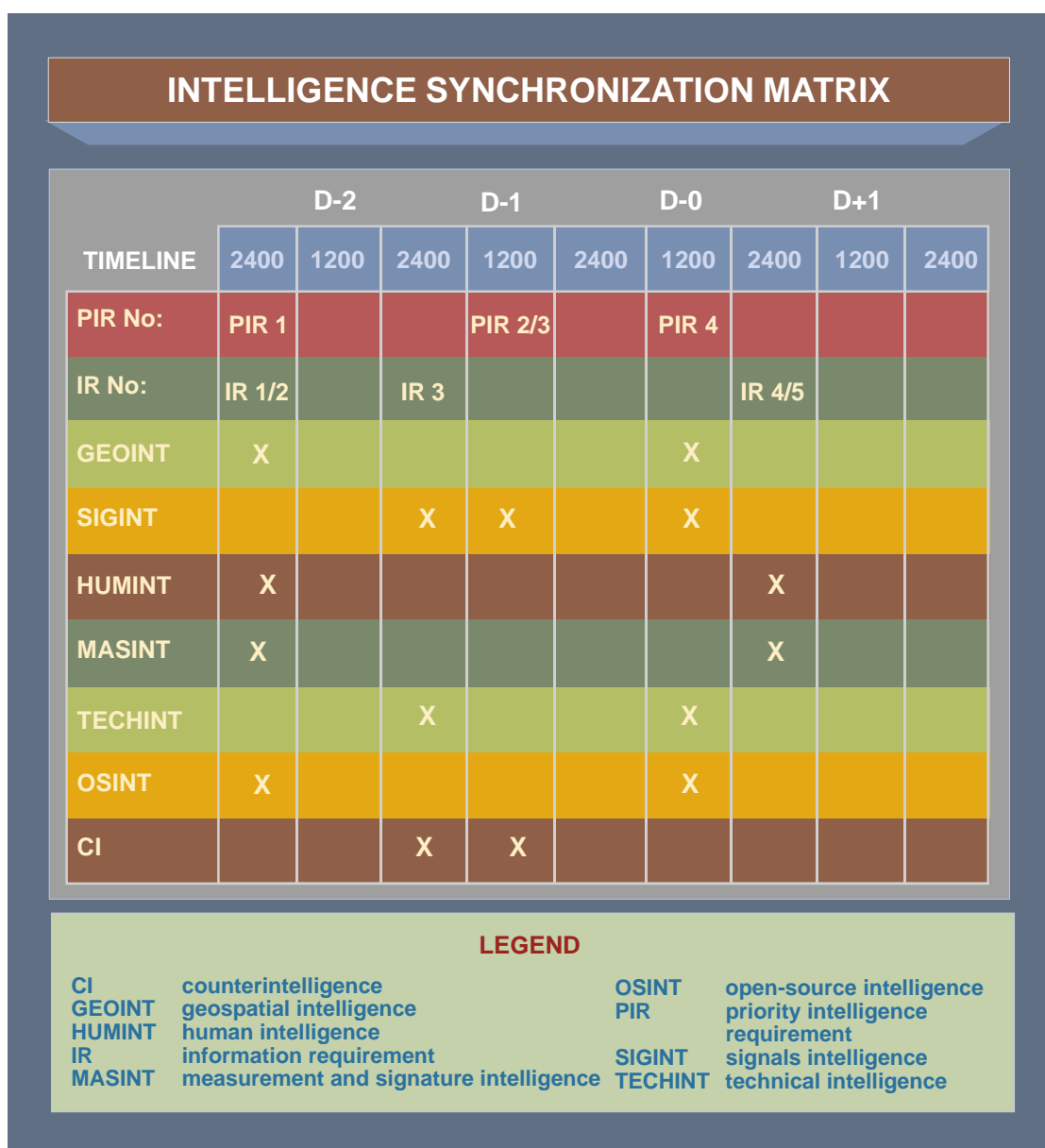


Figure III-3. Intelligence Synchronization Matrix

- (8) Timelines associated with the expected adversary activity; and
- (9) Competing collection requirements.

## SECTION B. EXECUTION

### 10. Overview

Execution begins when the President decides to use a military option to resolve a crisis. Only the President or Secretary of Defense can authorize the CJCS to issue an execute order (EXORD). The EXORD directs the supported commander to initiate military operations, defines the time to initiate operations, and conveys guidance not

provided earlier. The CJCS monitors the deployment and employment of forces, acts to resolve shortfalls, and directs action needed to ensure successful completion of military operations. Execution continues until the operation is terminated or the mission is accomplished or revised. JIPOE support is a particularly important prerequisite for military success throughout all phases of a joint operation regardless of how the battle evolves (see Figure III-4).

a. The purpose of phasing is to help the JFC organize operations by integrating and synchronizing subordinate operations. Phasing helps JFCs and staffs visualize and think through the entire operation or campaign and to define requirements in terms of forces, resources, time, space, and purpose. Phases are distinct in time, space, and/or purpose from one another, but must be planned in support of each other and should represent a natural progression and subdivision of the campaign or operation. From a strategic perspective, a joint operation can be described using the six primary phases depicted in Figure III-4 and discussed later in this chapter. The activities that predominate during a given phase, however, rarely align with neatly definable breakpoints. The need to move from one phase into another is normally identified by assessing that a set of objectives are achieved or that the enemy has acted in a manner that requires a major change in focus

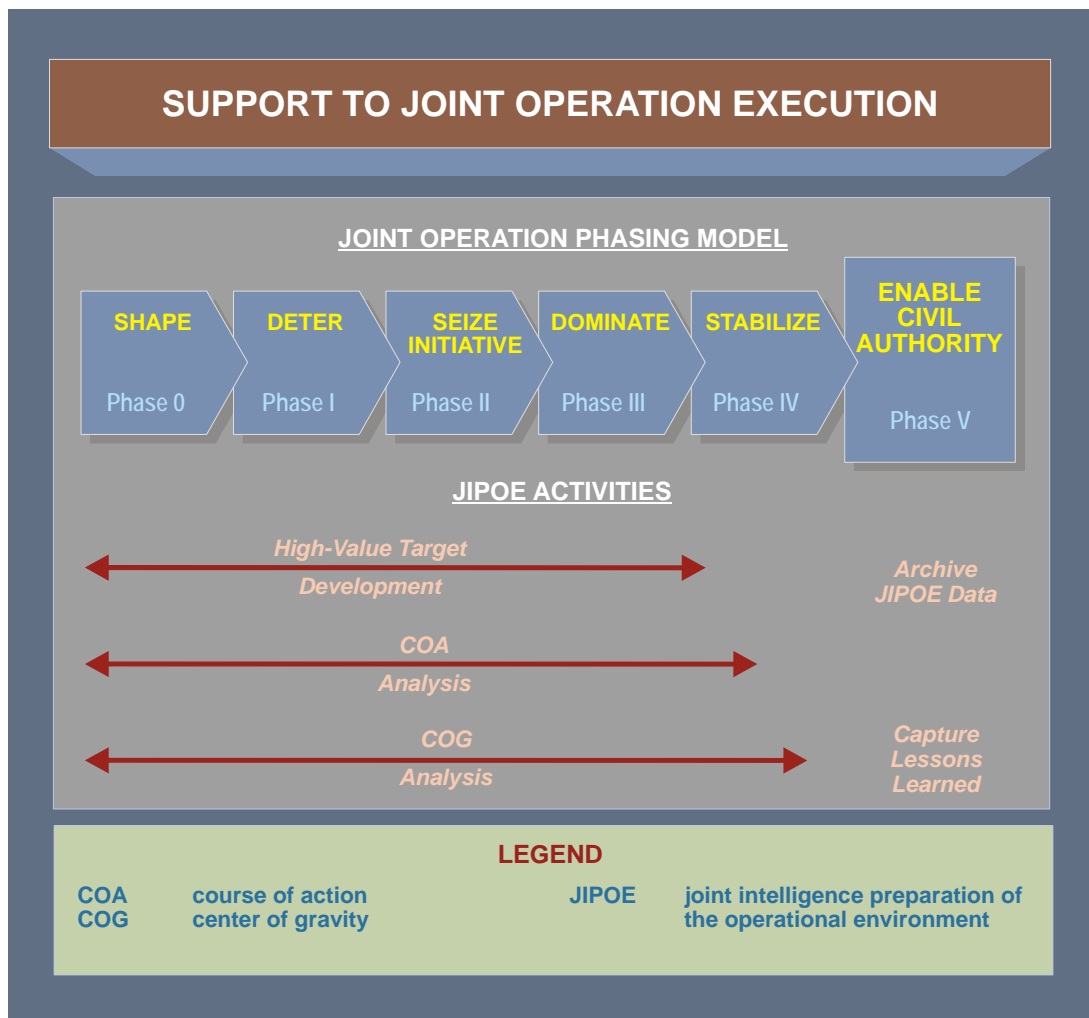


Figure III-4. Support to Joint Operation Execution



for the joint force and is therefore usually event driven, not time driven. **Within the context of these phases established by a higher-level JFC, subordinate JFCs and component commanders may establish additional phases that fit their CONOPS.** For example, the joint force land component commander (JFLCC) or a subordinate JTF might have the following four phases inside the CCCR's seize initiative phase: deploy, forcible entry, defense, and offense. The JFLCC could use the offense sub-phase as a transition to the CCCR's dominate phase.

b. During execution, the JIPOE effort must stay at least one step ahead of operations by simultaneously supporting the current phase of the operation *and* laying the informational groundwork required for subsequent phases. JIPOE analysts must continuously evaluate how the execution of each operation phase may require the modification of preplanned intelligence collection and production requirements. Optimizing the use of limited ISR assets and maximizing the efficiency of intelligence production resources requires constant anticipation of operational change by JIPOE planners.

c. JIPOE also supports operation order execution by continuously identifying and evaluating the adversary's strategic and operational COGs. Identification of adversary COGs requires detailed knowledge and understanding of how opponents organize, fight, make decisions, and their physical strengths and weaknesses. However, COGs can change during the course of an operation, and at any given time COGs may not be apparent or readily discernible. COGs can change during the course of an operation for a variety of reasons. For example, during the deter phase, the adversary's operational COG may be its preponderance of hardened, long range artillery sites. However, if hostilities commence and the objective changes from deterring an attack to defeating the adversary's maneuver units, the operational COG may change to the adversary's armored exploitation force. JIPOE analysts alert JFCs and their subordinates to circumstances that may cause COGs to change, thereby enabling the JFC to adjust friendly operations or COAs accordingly. Given their potentially transient nature, adversary COGs should be continuously reevaluated by JIPOE analysts throughout a joint operation.

## 11. Shape Phase

Before committing forces, JFCs are able to take actions to help shape the character of potential future operations. In many cases, these actions enhance bonds between future coalition partners, increase understanding of the region, help ensure access when required, strengthen future multinational operations, and prevent crises from developing. Intelligence activities conducted during the shaping phase help lay the groundwork for the JIPOE effort in all subsequent phases of the operation. Specifically, the JIPOE effort during the shaping phase should focus on initial target development resulting in target lists and target material production, identification of adversary COGs, vulnerabilities and susceptibilities to IO, key nodes, LOCs, and potential adversary COAs that would deny friendly access to bases and lodgment areas. A no-strike list and restricted target list should also be established during target identification and analysis. Early identification

of targets is a critical factor in friendly COA development. Whenever possible, HN and multinational participation in the JIPOE effort should be encouraged.

### **12. Deter Phase**

Before the initiation of hostilities, the JFC must gain a clear understanding of the national and military strategic objectives; desired and undesired effects; actions likely to create those effects; COGs and decisive points; and required joint, multinational, and nonmilitary capabilities matched to available forces. The J-2 assists the JFC in visualizing and integrating relevant considerations regarding the operational environment into a plan that will lead to achievement of the objectives and accomplishment of the mission. During the deter phase, the ongoing JIPOE effort is accelerated to focus on monitoring the current situation while simultaneously assessing adversary capabilities to affect subsequent phases of the operation. JIPOE analysts support indications and warning by looking for specific indications of imminent adversary activity that may require an immediate response or an acceleration of friendly decision-making processes. JIPOE efforts also concentrate on confirming adversary COGs and support the continuous refinement of estimates of adversary capabilities, dispositions, intentions, and probable COAs within the context of the current situation. At the same time however, JIPOE analysts must look ahead to prepare threat assessments that support planning for operations in subsequent phases.

### **13. Seize Initiative Phase**

As operations commence, the JFC needs to exploit friendly asymmetric advantages and capabilities to shock, demoralize, and disrupt the enemy immediately. The JFC seeks decisive advantage through the use of all available elements of combat power to seize and maintain the initiative, deny the enemy the opportunity to achieve its objectives, and generate in the enemy a sense of inevitable failure and defeat. Additionally, the JFC coordinates with the appropriate interagency representatives through a joint interagency task force, JIACG, or individually to facilitate coherent use of all instruments of national power in achieving national strategic objectives. During this phase, JIPOE analysts focus on adversary capabilities that may impede friendly force deployment from bases to ports of embarkation to lodgment areas. Additionally, the JIOC red team may use a “reverse JIPOE” process to analyze the friendly force from the adversary’s perspective, identify potential indicators of friendly COAs, and provide insight into the possible times and locations of the adversary’s intelligence collection plan. This insight assists deception planners in determining the best times and locations to plant deceptive information designed to mislead adversary intelligence analysts. The JIPOE effort is also crucial to intelligence collection planning and the formulation of an optimal ISR strategy. JIPOE products such as the event template and matrix help collection planners concentrate ISR assets at the correct time and location to detect anticipated adversary activity.

## **14. Dominate Phase**

During the dominate phase, JFCs conduct sustained combat operations by simultaneously employing conventional, SOF, and IO capabilities throughout the breadth and depth of the operational area. CMO is executed to preclude civilian interference in attainment of operational objectives or to remove civilians from operational areas. Some missions and operations (i.e., strategic attack, interdiction, and IO) are executed concurrently with other combat operations to deny the enemy sanctuary, freedom of action, or informational advantage. JFCs may design operations to cause the enemy to concentrate their forces, thereby facilitating their attack by friendly forces, or operations may be designed to prevent the enemy from concentrating their forces, thereby facilitating their isolation and defeat in detail. Operations may be linear (i.e., combat power is directed toward the enemy in concert with adjacent units) or nonlinear (i.e., forces orient on objectives without geographic reference to adjacent forces). During this phase, the JIPOE effort must be equally prepared to support linear and nonlinear operations. The complexity of nonlinear operations places a premium on a continuous flow of accurate and timely intelligence to help protect individual forces and support precise targeting. JIPOE also provides JFCs and component commanders with assessments of an enemy's capability, willingness, and intent to employ WMD, which can quickly change the character of an operation or campaign, threaten the cohesion of alliances and coalitions, and cause large-scale shifts in strategic and operational objectives, phases, and COAs. These assessments should identify known and suspected locations of enemy WMD stockpiles and delivery systems, anticipate the conditions under which the enemy is most likely to use WMD, and analyze the effects of WMD use on the operational environment. Intelligence must not only support operations during the dominate phase, but also anticipate and address the information requirements for the subsequent stabilize phase. For example, JIPOE analysts support target development by identifying the adversary's key infrastructure. This analysis should include consideration of what specific infrastructure will be required in the post-combat period to meet the requirements of the stabilize and enable civil authority phases. These infrastructure targets may warrant attack by nonlethal means in order to avoid the impact of permanent destruction on friendly operations. Additionally, JIPOE analysts must be prepared to assist the JFC in determining how to fill the power vacuum after the conclusion of sustained combat operations. In order to set the groundwork for stability operations, the JFC will require detailed intelligence regarding the status of key infrastructure, enemy government organizations and personnel, and anticipated humanitarian needs.

## **15. Stabilize Phase**

Stabilization typically begins with significant military involvement to include some combat, then moves increasingly toward enabling civil authority as the threat wanes and civil infrastructures are reestablished. As progress is made, military forces increase their focus on supporting the efforts of HN authorities, OGAs, IGOs, and/or NGOs. During the stabilize phase, the JIPOE effort transitions from supporting combat operations to focus on actual or potential threats to the joint force (e.g., insurgent groups, criminal elements, terrorist cells). Particular attention should be paid to identifying and assessing

the leaders of groups posing potential threats to civil authority and reconstruction efforts. JIPOE products should also identify critical infrastructure and analyze its vulnerability to disruption by elements hostile to stabilization efforts. Additionally, JIPOE analysts help PSYOP forces assess the effectiveness of PSYOP, a critical aspect of stabilization, in changing the behavior of the local populace to support civil authorities and reconstruction efforts.

### **16. Enable Civil Authority Phase**

This phase is characterized by the establishment of a legitimate civil authority that is enabled to manage the situation without further outside military assistance. In many cases, the US will transfer responsibility for the political and military affairs of the HN to another authority. The joint operation normally is terminated when the stated military strategic and/or operational objectives have been met and redeployment of the joint force is accomplished. Before the operation is terminated, it is important that all intelligence lessons learned are recorded in appropriate databases and are captured in joint doctrine. Likewise, the J-2 should ensure that all JIPOE products are appropriately archived. This material may prove valuable to operation planning in the event US or allied forces are directed to redeploy to the area.

## **SECTION C. ASSESSMENT**

### **17. Overview**

Assessment is a continuous process that measures the overall effectiveness of employing joint force capabilities during military operations. Commanders continuously assess the operational environment and the progress of operations, and then compare them to their initial vision and intent. Commanders and their staffs determine relevant assessment actions and measures during planning. They consider assessment measures as early as mission analysis, and include assessment measures and related guidance in commander and staff estimates. They use assessment considerations to help guide operational design in order to improve the sequence and type of actions along lines of operation. Assessment actions and measures help commanders adjust operations and resources as required, determine when to execute branches and sequels, and make other critical decisions to ensure current and future operations remain aligned with the mission and desired end state. Assessment occurs at all levels and across the entire range of military operations. Strategic- and operational-level assessment efforts concentrate on broader tasks, objectives, the conditions necessary to achieve objectives, and progress toward the end state, while tactical-level assessment focuses on task accomplishment. Even in operations that do not include combat, assessment of progress is just as important and can be more complex than traditional combat assessment. The JIPOE process supports assessment by helping the commander and staff decide what aspects of the operational environment to measure and how to measure them to determine progress toward accomplishing tasks, and setting conditions necessary to achieve an objective. Specifically, JIPOE supports assessment by analyzing COAs, identifying COGs and decisive points, nominating and monitoring HVTs, and establishing measures of

adversary activities (indicators) associated with a specific COA or reaction to friendly operations (see Figure III-5).

## 18. Assessment Process

a. As depicted in Figure III-5, the assessment process uses measures of performance (MOPs) to evaluate task performance at all levels of war, and measures of effectiveness (MOEs) to determine progress of operations toward achieving objectives. MOPs are used to measure task accomplishment, and answer the question, was the action taken and were tasks completed to standard? MOEs are used at the strategic, operational, and tactical levels to assess changes in adversary behavior, capabilities, or the operational environment. The JFC also can use MOEs to determine progress toward success in those operations for which tactical-level combat assessment ways, means, and measures do not apply. MOEs help answer questions such as, are we doing the right things, are our actions contributing to the conditions necessary to achieve the objective, or are alternative actions required? Well-devised measures can help the commanders and staffs understand the relationship between specific actions and resulting effects. Both MOPs

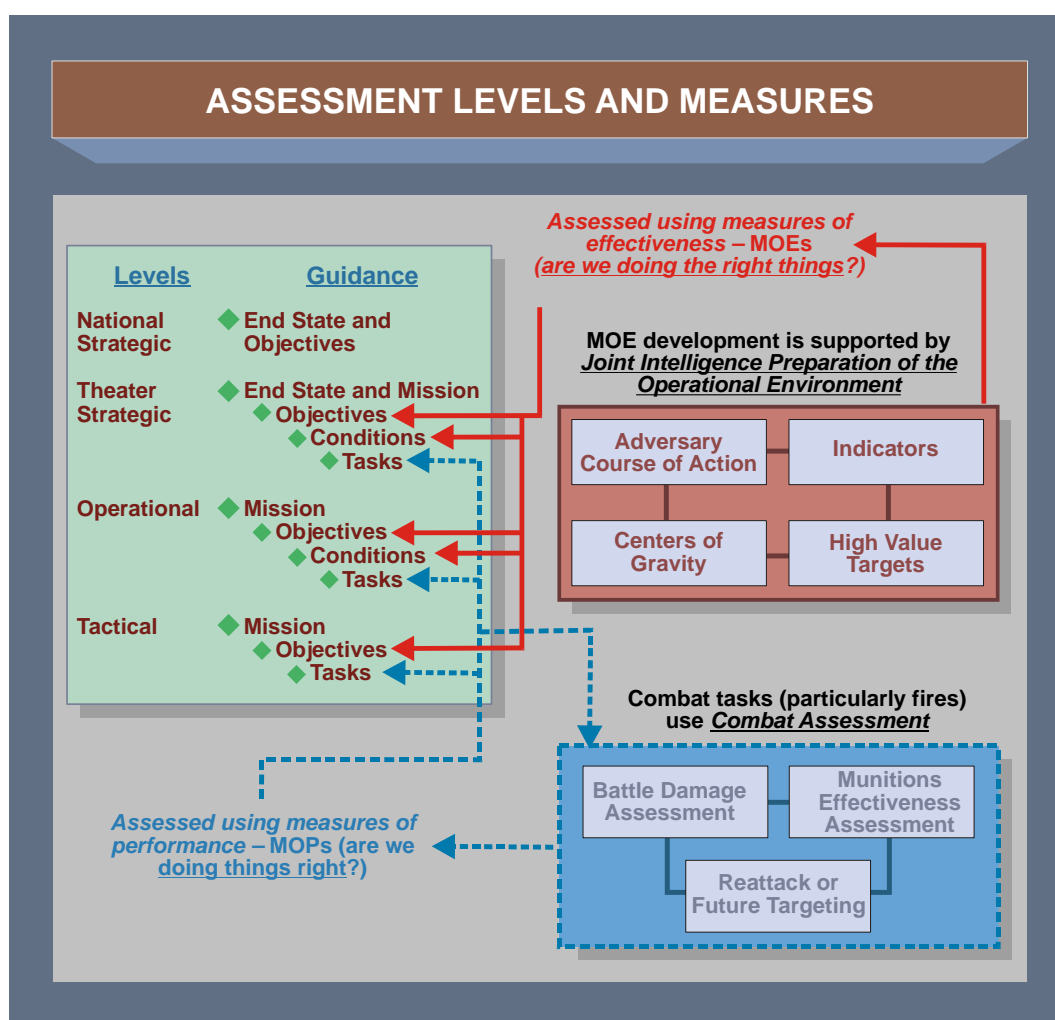


Figure III-5. Assessment Levels and Measures

and MOEs can be quantitative or qualitative in nature, but meaningful quantitative measures are preferred because they are less susceptible to subjective interpretation. MOEs are based on observable and measurable indicators. Indicators provide evidence that a certain condition exists or certain results have or have not been attained, and enable decision makers to assess progress towards the achievement of the objective. Several indicators may make up an MOE, just like several MOEs may assist in measuring progress toward achievement of an objective.

b. The assessment process and related measures should be **relevant**, **measurable**, **responsive**, and **resourced** so there is no false impression of accomplishment. Quantitative measures can be helpful in this regard.

(1) **Relevant.** MOPs and MOEs should be relevant to the task, effect, operation, the operational environment, the end state, and the commander's decisions. This criterion helps avoid collecting and analyzing information that is of no value to a specific operation. It also helps ensure efficiency by eliminating redundant efforts.

(2) **Measurable.** Assessment measures should have qualitative or quantitative standards they can be measured against. To effectively measure change, a baseline measurement should be established prior to execution to facilitate accurate assessment throughout the operation. Both MOPs and MOEs can be quantitative or qualitative in nature, but meaningful quantitative measures are preferred because they are less susceptible to subjective interpretation.

(3) **Responsive.** Assessment processes should detect situation changes quickly enough to enable effective response by the staff and timely decisions by the commander. The JFC and staff should consider the time required for an action or actions to produce desired results within the operational environment and develop indicators that can respond accordingly. Many actions directed by the JFC require time to implement and may take even longer to produce a measurable result.

(4) **Resourced.** To be effective, the assessment must be adequately resourced. Staffs should ensure resource requirements for data collection efforts and analysis are built into plans and monitored. Effective assessment can help avoid both duplication of tasks and unnecessary actions, which in turn can help preserve combat power.

*The assessment process is explained in greater detail in JP 3-60, Joint Targeting, JP 3-0, Joint Operations, and JP 5-0, Joint Operation Planning.*

### 19. Support to Assessing Performance

The results of tactical tasks are often physical in nature, but also can reflect the impact on specific functions and systems. Tactical-level assessment may include assessing progress by phase lines; neutralization of enemy forces; control of key terrain, people, or resources; and security or reconstruction tasks. Combat assessment is an example of a tactical-level assessment and is a term that can encompass many tactical-



level assessment actions. Combat assessment typically focuses on determining the results of weapons engagement (with both lethal and nonlethal capabilities), and thus is an important component of joint fires and the joint targeting process. It helps the CCCR, the subordinate JFC, and component commanders understand how the joint operation is progressing and assists in shaping future operations. JIPOE analysts help assess task accomplishment by supporting the three components of combat assessment (battle damage assessment, munitions effectiveness assessment, and reattack recommendation). At the strategic and operational levels, JIPOE products provide much of the substantive baseline analysis and characterization of systems and functional capabilities required for target system analysis and task assessment. At the operational level, the JIPOE process supports target development by determining the anticipated times and locations where adversary targets are expected to appear. At the tactical level, JIPOE support may also include analysis of specific target composition and vulnerability. This data enables target systems analysts to develop the specific battle damage indicators and MOPs to assess task accomplishment.

*For further information on combat assessment, see JP 3-60, Joint Targeting, and JP 2-0, Joint Intelligence.*

## **20. Support to Assessing Effectiveness**

JIPOE analysts support assessment by analyzing adversary capabilities, vulnerabilities, and intentions, and by continuously monitoring the numerous aspects of the operational environment that can indicate the effectiveness of friendly operations. JIPOE analysts help identify potential desired and undesired consequences of friendly actions, how those consequences affect the conditions necessary to achieve the objective, and the development of related MOEs by analyzing adversary COAs, COGs, key nodes and links, and other significant characteristics of the operational environment as they relate to the friendly mission, end state, and objectives. JIPOE analysts provide objective assessments that gauge the overall impact of military operations against adversary forces and estimate likely adversary reactions and counteractions. JIPOE products, supplemented by the use of a red team to critically examine the MOE from the adversary's perspective, help ensure the JFC is measuring the "important things". The JIPOE process is particularly valuable in identifying and developing indicators (which are the foundation of MOEs) to monitor changes in adversary system behavior, capabilities, or the operational environment. These indicators help JFCs, their staffs, and component commanders determine if the joint force is "doing the right things" to achieve objectives, not just "doing things right."

a. As discussed in Chapter II, "The Process for Joint Intelligence Preparation of the Operational Environment," indicators are associated with an adversary's adoption of a specific COA and are based on adversary doctrine (or observation of past practices) as modified by the physical constraints imposed by the operational environment. Indicators should also be developed (time permitting) for the various branches and sequels associated with each COA. The actions associated with these branches and sequels are graphically depicted on a series of situation templates which are in turn consolidated into



an event template and matrix. The event matrix summarizes the anticipated events in time and space that would indicate changes in adversary behavior, systems, or the operational environment in response to friendly military operations. Additional refinement of these events results from the wargaming effort during joint operation planning. These events, or indicators of change, may be assigned qualitative or quantitative thresholds and are used to support the development of MOEs.

b. The JIPOE process enables real-time, persistent surveillance of indicators associated with MOEs. It does this by helping to focus the joint force's ISR resources at the times and locations most likely to detect adversary activity relevant to assessment (i.e., adversary adoption of branches or sequels in reaction to friendly operations). JIPOE analysts receive collected information and provide continuous assessment updates to the JFC and staff based on the status of MOE-related indicators.

## CHAPTER IV

### SPECIAL CONSIDERATIONS

*“Not a Frenchman then doubted that such rapid victories must have decided the fate of the Spaniards. We believed, and Europe believed it too, that we had only to march to Madrid to complete the subjection of Spain...The wars we had hitherto carried on had accustomed us to see in a nation only its military forces and to count for nothing the spirit which animates its citizens.”*

**Napoleonic soldier on the French occupation of Spain and subsequent Spanish insurgency, 1808**

#### 1. Introduction

In its most basic sense, the JIPOE process simply combines an understanding of the constraints and influences imposed by the operational environment with the normal *modus operandi* of an adversary in order to forecast that adversary's future actions. This basic JIPOE process is relevant throughout the range of military operations. However, some types of missions, operations, and situations may require a more tailored JIPOE approach that places greater emphasis on specific aspects of the operational environment. For example, stability operations require an approach that places far greater emphasis on understanding the civil population and critical infrastructure. Likewise, the contribution of the JIPOE effort to countering asymmetric approaches requires techniques and products that are specifically tailored to the types of joint operations capable of defending against and defeating asymmetric threats. Finally, some situations (particularly crisis response operations) will require JIPOE analysts to adopt a nontraditional, broad view of what constitutes an “adversary” (e.g., disease, starvation, floods). This chapter discusses *some* of the special considerations, procedures, and types of products that JIPOE planners and analysts may find useful in specific situations. The discussion is intended only as a point of departure for JIPOE analysts to further develop specific techniques and products based on their initiative, imagination, and innovation.

#### SECTION A. SUPPORT DURING STABILITY OPERATIONS AND IRREGULAR WARFARE

#### 2. Overview

JP 1, *Doctrine for the Armed Forces of the United States*, describes both traditional war (a confrontation between nation states or coalitions/alliances of nation-states) and IW. Traditional war typically involves small-scale to large-scale, force-on-force military operations in which adversaries employ a variety of conventional military capabilities against each other. By contrast, IW, which has emerged as a major and pervasive form of warfare, typically involves a less powerful adversary that seeks to disrupt or negate the military capabilities and advantages of a more powerful, conventionally armed military force, which often represents the nation's established regime. IW favors indirect and asymmetric approaches, though it may employ the full range of military and other capacities, in order to erode an adversary's power, influence, and will. What makes IW

“irregular” is its focus— a relevant population — and its strategic purpose — to gain or maintain control or influence over, and the support of that relevant population through political, psychological, and economic methods. Friendly forces may also engage in stability operations to restore order in the aftermath of an irregular or traditional war or a natural disaster. Stability operations encompass various military missions, tasks, and activities conducted outside the United States in coordination with other instruments of national power to maintain or reestablish a safe and secure environment and provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief. Stability operations likely will be conducted in coordination with and in support of HN authorities, OGAs, NGOs, IGOs, and the private sector. The long-term goal is to help develop indigenous capacity for securing essential services, developing a viable economy, establishing a legal process that conforms to local cultural norms, and restoring civil society with functioning institutions. JIPOE support during operations that focus on the civil population as a COG requires a different mindset and different techniques than a JIPOE effort that focuses on defeating an adversary militarily. The following discussion identifies some of the special considerations relevant to applying the JIPOE process in support of nontraditional missions. Appendix B, “Somalia 1992-1993— A Case Study of Support to Stability Operations and Irregular Warfare,” illustrates many of the constructs discussed in this section.

### 3. Increased Emphasis on Sociocultural Factors

JIPOE support during stability operations and IW requires a more detailed understanding of the relevant area’s sociocultural factors than is normally the case during traditional war. JFCs, subordinate commanders, and their staffs must understand the cultural landscape in which they operate in order to make sound decisions concerning force protection and the deployment of forces. JIPOE products must describe the impact of ethnic groups and religions, to include their associated leadership, the locations of places of worship and cultural/historical significance, languages being spoken, population density, age, living conditions, allocation of wealth, and means of income. This information provides the backdrop against which an analysis of social and political factors will allow for successful stability operations to include, when necessary, establishing the process for initiating elections and establishing government. The key social and political factors revolve around understanding previous political systems, parties, formal and informal leaders, affiliations, political grievances, loyalty to former local, regional, and national government officials, patterns of political tolerance or violence, and the education system. This information will provide an appreciation of the nation’s cultural landscape, its previous and potential future leaders, and its expectations of governance and civil institutions. In order to accomplish this, JIPOE analysts must develop a comprehensive understanding of the following factors:

a. **Society.** A society is a population whose members are subject to the same political authority, occupy a common territory, have a common culture, and share a sense of identity. Every society has social structure and culture; however, societies are dynamic and heterogeneous. JIPOE must consider societies or societal links to groups

outside the operational area and the impact of society on the overall operational environment.

**b. Social Structure.** Social structure refers to the relations among groups of persons within a society and involves the arrangement of the parts that constitute society, organization of social positions, and distribution of people within those positions. Understanding social structure provides insight into how a society functions. Groups may be based on racial, ethnic, religious, or tribal identities. Group identity is more than being aware of what the societal make up is by percentage or group. The JIPOE assessment of ethnic breakdown must explore its relationship to any dislocated civilian problems, religious affiliations, historic grievances and conflict, loyalty to formal and informal leaders, points and dates of cultural significance, and language. Even in a society that is seemingly devoid of any coherent social system, the reality is that a system still does exist. For example, a clan-based society that is made up of entities struggling to seize and maintain power is a system in itself. Failure to conduct detailed analysis creates the risk of new or renewed tensions and violence, thereby undermining any effort towards a safe and secure environment or enduring institutions.

(1) Races and ethnic groups are key aspects of social structure. A race is a human group that is different by virtue of innate physical characteristics. An ethnic group is a community whose learned cultural practices, language, history, ancestry, or religion distinguish them from others. Religious groups may be subsets of larger ethnic groups. Racial or ethnic groups are often key sources of friction within societies.

(2) Networks may be an important aspect of a social structure as well as within the insurgent organization. Common types of networks include elite networks, prison networks, worldwide ethnic and religious communities, and neighborhood networks. JIPOE must determine what networks exist, what their purpose is, who is involved, how they operate, and how they adapt.

(3) Groups collectively engaged to complete a common task are called institutions. Institutions are the long-term building blocks of societies. Organizations are institutions with bounded membership, defined goals, established operations, fixed facilities or meeting places, and means of financial or logistic support. Organizations may be communicating, religious, economic, social, or any combination of the previous four categories, and they may control, direct, restrain, or regulate the local populace. It is important to determine which members of what groups belong to each organization and how their activities may affect the local populace, whose interests they fulfill, and what role they play in influencing local perceptions.

(4) JIPOE analysts must understand the dynamic interaction among social groups to include formal relationships (such as treaties or alliances), informal relationships (such as custom or common understanding), divisions or cleavages, and cross-cutting ties (such as religious alignments that cut across ethnic differences).

(5) Another factor that must be assessed by the JIPOE analyst is the means in which the subgroups within the cultural landscape communicate and receive information. On the surface, it may seem obvious for the joint force to communicate to the populace through established media such as newspapers or broadcast. However, in some societies the populace may not have broad access to these sources of information, or may even have a cultural or historical mistrust of established media sources of information.

(6) JIPOE analysts must also understand the importance of roles, status, and norms within the society. Members of a society interact with social positions, and these social positions are referred to as status. For example, most societies associate particular statuses with particular social groups, such as family, ethnicity, or religion, and every social status has a corresponding cluster of expected behaviors (roles) that dictate how a person is expected to think, feel, or act. The standard of conduct for given roles and status is known as a social norm. A social norm is what people are expected to do or should do, rather than what people actually do. Norms may be either moral or customary. When a person's behavior does not conform to social norms, it will result in social disapproval. Social status and roles dictate social norms that may significantly impact stability operations.

(7) JIPOE products should inform the planning process by identifying historical patterns of crime in local areas as well as locations of police stations and jails. The JIPOE effort should also address the relationship between the population and police, the current or past methods of justice, how stability operations may drive criminal activity, and who will be the perpetrator or victim of crimes.

c. **Culture.** Once the social structure has been thoroughly assessed, the JIPOE effort should identify and analyze the culture of the society as a whole and of each major group within the society. Culture is a system of shared beliefs, values, customs, behaviors, and artifacts that members of a society use to cope with their world and with one another. Culture is habitual and perceived as “natural” by people within the society. Culture conditions an individual's range of action and ideas; influences how people make judgments about what is right, wrong, important or unimportant; and dictates how members of a society are likely to perceive and adapt to changing circumstances. Where social structure comprises the relationships within a society, culture provides meaning within the society. JIPOE should identify and analyze the culture of the society as a whole and of each major group within the society.

(1) **Identity.** Primary identities can be national, racial, and religious (specific examples could be tribe and clan affiliation). Secondary identities include past times or personal preferences. Individuals belong to multiple social groups which determine their cultural identities. Furthermore, people tend to rank order these identities depending on the importance they place on different groups. As a result, an individual's cultural identities may conflict with one another, such as when tribe loyalty may conflict with political affiliation.

(2) **Beliefs.** Beliefs are concepts and ideas accepted as true. Core beliefs are part of an individual's primary cultural identity and are highly resistant to change. Examples include religious beliefs, the importance of individual and collective honor, and the role of the family. Attempts to change the central beliefs of a culture may result in significant unintended second and third order consequences.

(3) **Values.** A value is an enduring belief that a specific mode of conduct is preferable to an opposite or converse mode of conduct. Values include beliefs concerning such topics as toleration, stability, prosperity, social change, and self-determination. Each group to which an individual belongs inculcates that person with its values and their ranking of importance. Since individuals are affiliated with multiple groups, their associated values are sometimes in conflict. For example, religious values may conflict with generational values or gender values.

(4) **Attitudes and Perceptions.** Attitudes are affinities for and aversions to groups, persons, and objects. Attitudes affect perception, which is the process by which an individual selects, evaluates, and organizes information from the external environment.

(5) **Belief Systems.** The totality of the identities, beliefs, values, attitudes, and perceptions that an individual holds (and the ranking of their importance) constitutes that person's belief system. Belief systems act as filters through which individuals process and adapt to new information.

(6) **Cultural Forms.** Cultural forms are the concrete expression of the belief systems shared by members of a particular culture. These forms include language, rituals, symbols, ceremonies, myths, and narratives and are the medium for communicating ideologies, values, and norms that influence thought and behavior. A culture's belief system can be decoded by observing and analyzing its cultural forms.

(a) **Language.** Language is a learned element of culture. Communication requires more than just grammatical knowledge; it requires understanding the social setting, appropriate behaviors towards people of different statuses, and nonverbal cues, among other things.

(b) **Rituals.** A ritual is a stereotyped sequence of activities involving gestures, words, and objects. Rituals can be either religious or secular.

(c) **Symbols.** Institutions and organizations often use cultural symbols to amass political power or generate resistance against external groups.

(d) **Ceremonies.** Ceremonial behavior can follow rigid etiquette or a prescribed formality. Just like rituals, it is vital to understand not only the ceremony, but the context in which they take and the meaning thereof.

(e) **Myths.** Myths serve to explain some phenomenon which to the populace can have a great influence on the perceived truth. The counterinsurgent must understand that some myths are as resilient as the truth, and can influence the target audience either negatively or positively.

(f) **Narratives.** Narratives are the means through which ideologies are expressed and absorbed by members of a society. The most important cultural form for counterinsurgents to understand is the narrative.

d. **Power and Authority.** The JIPOE effort should identify how both formal and informal powers are apportioned and used within a society. Often in stability operations, informal power holders, such as ethnoreligious groups, social elites, and religious figures are more important than formal power holders. Often, the key power holders with connections and influence in a society operate behind the scenes, and are therefore difficult to identify and assess. JIPOE products should identify these key individuals and assess their motivations and strategies. The JIPOE effort should also identify current and emerging parties; formal and informal leaders; party and leader influence on local, regional, and national levels; ties to threat or religious entities; facilities; and financial means of support. The JIPOE process also identifies previous actors and influencers as well as current political parties and their agendas; analyzes the local, regional, and national concept of what constitutes a legitimate government, and determines any political grievances that the population may have had locally, regionally, or nationally. A complete JIPOE analysis will inform not only the potential timing for establishing a civil government, but also the nature of the government that should be established and the political personalities who should (or at least should not) establish it and occupy key offices. For example, conducting elections in Bosnia prior to the establishment of viable institutions resulted in the return of officials who were tied to or were of like mind to those who had initiated the conflict. JIPOE analysts must understand the types of power each group has, what it uses that power for, and how it acquires and maintains power. Four major forms of power in a society include coercive force, social capital, economic power, and authority.

(1) **Coercive Force.** Coercion is the ability to compel a person to act through threat of harm or by the use of physical force. Coercive force can be positive or negative. Groups may use coercive means for a variety of purposes such as protecting their community, carrying out vendettas, and engaging in criminal activity. One essential role of government is providing physical security for its citizens by monopolizing the use of coercive force for legitimate purposes.

(2) **Social Capital.** Social capital refers to the power of individuals and groups to use social networks of reciprocity and exchange to accomplish their goals. In many societies, patron-client relationships are an important form of social capital. In a system based on patron-client relationships, an individual in a powerful position provides goods, services, security, or other resources to followers in exchange for political support or loyalty, thereby amassing power.



(3) **Economic Power.** Power may be based on the ability of a group or individual to use formal or informal economic incentives and disincentives to change people's behavior. Economic systems can be formal, informal, or a mixture of both. In weak or failed states, the formal economy may not function well. The informal economy refers to such activities as smuggling, black market activities, barter, and exchange. For example, in many societies, monies and other economic goods are distributed through tribal or clan networks through patronage systems. JIPOE must analyze how groups use economic power with the operational environment and how that power can be exploited.

(4) **Authority.** In some societies substantial power stems from the authority associated with a social position. Authority may be grounded in law and contract and codified in impersonal rules. Alternatively, authority may be exercised by leaders who have unique, individual charismatic appeal, whether ideological, religious, political, or social. Authority may also be invested in a hereditary line or particular office by a higher power.

e. **Interests.** Interests refer to the core motivations that drive behavior. These include physical security, basic necessities, economic well-being, political participation, and social identity. During times when the government does not function, groups and organizations to which people belong satisfy some or all of their interests that the government does not. The interests of civil populations usually include physical security, essential services, economic well-being, and political participation.

(1) **Physical Security.** During any period of instability, people's primary interest is physical security for themselves and their families. When the US, HN, or multinational forces fail to provide security or threaten the security of civilians, the population is likely to seek security guarantees from insurgents, militias, or other armed groups. JIPOE analysts should determine the extent to which the population is safe from harm, whether there is a functioning, fair, and nondiscriminatory police and judiciary system, and who provides security in the absence of a functioning state apparatus.

(2) **Essential Services.** Essential services provide those things needed to sustain life and include items such as food, water, clothing, shelter, electricity, waste removal, and medical treatment. People pursue their essential needs until they are met and tend to support any group that provides such services. Stabilizing a population requires meeting these needs.

(3) **Economy.** A society's individuals and groups satisfy their economic interests by producing, distributing, and consuming goods and services. How individuals satisfy their economic needs depends on the society's level and type of economic development. For instance, in a rural-based society, land ownership may be a major part of any economic development plan, while in urban societies public and private sector jobs may be of greater concern. Real or perceived economic disparities among social groups can contribute to political instability and insurgents may attempt to exacerbate such disparities by attacking the economic infrastructure of a society. JIPOE analysts

help identify economic disparities and assess the vulnerabilities and capabilities of economic infrastructure.

(4) **Political Participation.** Another common interest of civil populations concerns the right to effective political representation and participation. Groups that have been denied participation in the political process often support insurgencies or organizations that promise enfranchisement. Very often, such groups rally around traditional or charismatic authority figures.

### 4. Increased Importance of Infrastructure Analysis

a. Infrastructure analysis takes on added importance as the focus of military operations shifts from target development during traditional war to the reconstruction of facilities and reestablishment of services during stability operations. Infrastructure analysis should emphasize what currently exists and what is a critical shortfall locally, regionally, and nationally. JIPOE analysts should also assess the vulnerability of critical infrastructure to sabotage, direct attack, or other interference by the adversary. JIPOE infrastructure analysis must be tailored to orient commanders and planners on the priorities for US military, interagency, NGO, and IGO relief immediately and over time so as to prevent humanitarian crises and to reinforce a secure and stable environment.

b. From an infrastructure perspective, it is imperative to understand the current state of the previous and remaining government services, associated civilian expertise, transportation nodes, lines of communications, hospital and medical facilities and public utilities as well as what is projected to remain. An accurate portrayal of the infrastructure status will potentially prevent or help eliminate humanitarian crises. JIPOE analysts should focus not only on what infrastructure is available, but also what is missing and the means by which it may be obtained. Subsequent to the initial needs, an assessment must be conducted in terms of the industrial, financial, and import/export systems within the country. Enduring institutions will require operating expertise, potential rebuilds or enhancement, security, monetary assistance, and resource inputs to not only restart but also to expand the inherent or existing capabilities and institutions. Doing so will allow the gradual build up of the enduring institutions necessary for immediate assistance and long-term success. For example, during Operation JUST CAUSE, US forces gradually subdued looting crowds and secured the 142 sites that provided Panama City's sanitation, power, water, telephone, and other public services after three days of anarchy, initiating the rebuilding of Panama's infrastructure and an economy racked by years of corruption.

### 5. Heavier Emphasis on Detailed Knowledge

JIPOE analysts must use information from a variety of intelligence and non-intelligence sources and methods and use appropriate analytical strategies to develop the type of detailed knowledge required during stability operations. Determining the cultural landscape of the operational area requires a heavy reliance on information from open sources, civilian academic centers of excellence, and local officials and law enforcement. Although the JIPOE effort will require input from all intelligence disciplines, HUMINT

and GEOINT assume increased importance in stability operations. In combination, HUMINT, GEOINT, and other sources enable the creation of products invaluable during stability operations and IW. For example, US and multinational forces operating in an urban environment will require the ability to correctly orient their forces against specific street addresses based on local tip-off information. Operations directed against the wrong building or dwelling may have unintended and/or undesired consequences. In many situations, however, street addresses in foreign urban areas do not use conventional numbering or structured identification systems. In these situations, HUMINT and information derived from open sources and local postal officials may be combined with GEOINT to produce accurate street address maps. Likewise, local law enforcement officials are crucial sources of information regarding criminal organizations, individuals, activities, areas, and methods. Mapping relevant sociocultural and environmental factors utilizes information and intelligence from multiple sources (intelligence disciplines, police units, military patrols, civil affairs units, provincial reconstruction teams, etc.) to produce network analysis diagrams and corresponding geospatial products. Figure IV-1 depicts using reported data, a network perspective, and a geospatial perspective to understand the sociocultural and environmental factors of the operational environment.

a. **Geospatial Intelligence.** GEOINT applies to all spatially referenced functions, data, and activities within the JIPOE process, and GEOINT data and processes provide the foundation for all fusion, analysis, and visualization activities. It is essential that GEOINT support be coordinated in advance between the joint force, national agencies, combatant commands, and allied and HN forces in order to form a common point of reference and framework for JIPOE. The accuracy and scale of foreign maps and charts may vary widely from US products. Additionally, release of US geospatial and JIPOE products and information may require foreign disclosure approval. While joint operations graphics are often used as the standard scale for joint plans and operations, stability operations require extremely accurate geospatial products and information with significantly greater detail. The JFC must ensure that all subordinate commands utilize compatible GEOINT products, data, and standards to ensure JIPOE processes and products developed by the joint force J-2 adequately support the mission. The joint force GEOINT staff officer will assist all units and activities participating in stability operations to acquire all GEOINT products prescribed by the JFC.

b. **Human Intelligence.** Due to the emphasis placed on understanding the civil population, HUMINT assumes increased importance during stability operations and IW and often provides the most valuable sources of information. However, a HUMINT infrastructure may not be in place when US forces initially arrive. Appropriate liaison channels need to be established as quickly as possible with multinational partners and appropriate elements within the HN while HUMINT operations are established. This will require early planning and release authority for exchanging intelligence with the HN and other multinational partners. Operational circumstances may also require the insertion of HUMINT personnel into the operational area ahead of a joint force. HUMINT can provide route reconnaissance, ground truth reporting, intentions, and enabling support for other intelligence disciplines. In addition, HUMINT and CI operations provide information on foreign intelligence services and terrorist activities in the operational area

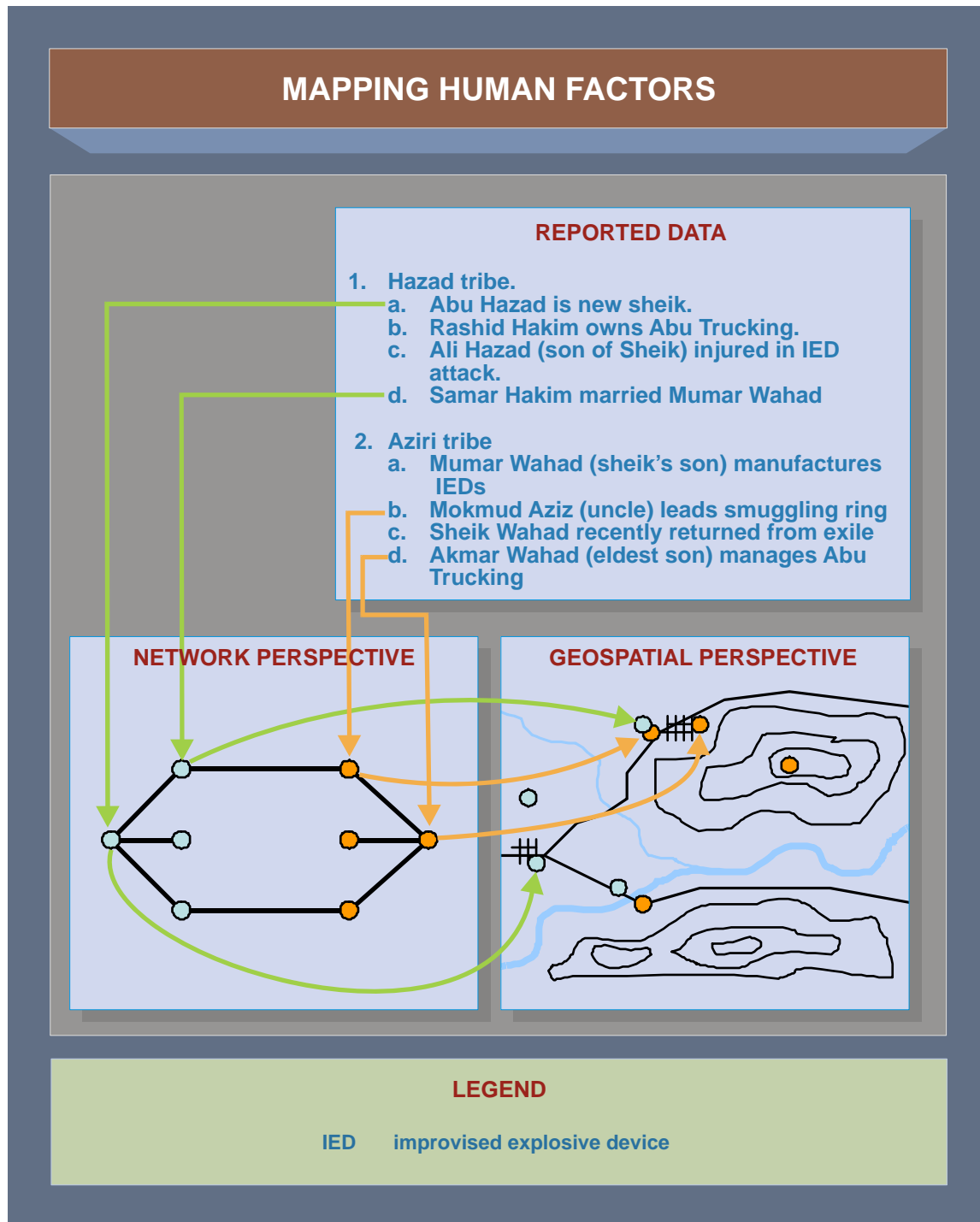


Figure IV-1. Mapping Human Factors

that allow CI assets to identify, exploit, or neutralize an adversary's capabilities and initiative. HUMINT can also be a critical element in supporting special operations.

## 6. Increased Need for Collaboration and Information Sharing

a. During stability operations and IW, the joint force will usually operate in a complex international environment alongside other important actors that will have a need for JIPOE products. They are also likely to possess valuable information they can provide the joint force that is unique to their own mission and sources. The J-2 must have a process in place to exchange information with external sources and assess the validity of information supplied by mission partners. This process should include foreign disclosure officers, delegated with the proper authority to disclose classified military information to foreign government and international organizations in accordance with legal and policy guidelines. Mission partners may include USG interagency members, UN organizations, allied coalition military and security members, local indigenous military and security forces, NGOs, and private companies and individuals providing contract services within the operational area. Although the joint force may have organic ISR capabilities assigned, the aforementioned mission partners may, in fact, provide the bulk of information for analyzing the operational environment during stability operations and IW. The J-2 will find the information coming from these disparate entities just as valuable, or more so, for assessing the overall situation than traditional intelligence sources. Therefore, a robust information sharing process will be required with individuals operating at multiple classification levels. Wherever possible, consistent with DOD Directive 5530.3 *International Agreements*, the J-2 should establish routine procedures to foster a cross-flow of information. Information from mission partners may not arrive in standard DOD or IC formats, and will require validation to assess veracity prior to inclusion in JIPOE assessments. Nonetheless, the information provided by the mission partners is critical for the JIPOE effort to produce a comprehensive picture of the operational environment.

b. Support to stability operations will require JIPOE planners to collaborate closely with IC elements to obtain expertise and materials that do not exist at the JTF level. This will occur to a greater extent during stability operations due to a reduced ISR support structure and a less clearly defined adversary. In some cases, external support for analyzing sociocultural factors or tracking the financial activities of potentially threatening individuals, groups, or activities may be required. In other contingencies, a majority of the JIPOE output will be GEOINT products. This may be the case when the primary adversary is terrain or weather factors. Other products deemed of interest may be obtained or provided by producers external to the JTF or combatant command. For example, MIPOE products can be obtained from the National Center for Medical Intelligence (NCMI), which serves as the DOD focal point for medical intelligence. Requests for external support should be coordinated through the combatant command JIOC or joint force JIPOE coordination cell (when formed).

## 7. Focused Process and Tailored Products

The primary difference between the basic JIPOE process during traditional war and the JIPOE effort during stability operations and IW is one of focus; particularly in the high degree of detail required, and the strong emphasis placed on demographic analysis

*"Imagine cartography in three dimensions, as if in a hologram. In this hologram would be the overlapping sediments of group and other identities atop the merely two-dimensional color markings of city-states and the remaining nations, themselves confused in places by shadowy tentacles, hovering overhead, indicating the power of drug cartels, mafias, and private security agencies. Instead of borders, there would be moving 'centers' of power, as in the Middle Ages. Many of these layers would be in motion. Replacing fixed and abrupt lines on a flat space would be a shifting pattern of buffer entities... To this protean cartographic hologram one must add other factors, such as migrations of populations, explosions of birth rates, vectors of disease. Henceforward the map of the world will never be static. This future map – in a sense, the 'Last Map' – will be an ever-mutating representation of chaos."*

**SOURCE: Robert D. Kaplan, "The Coming Anarchy,"  
The Atlantic Monthly, Feb 1994**

of the civil population. JIPOE products must be tailored to the situation and focus on analyzing the vulnerabilities of critical infrastructure, understanding the motivations of the adversary, and identifying any shared aspirations, values, or outlooks that link the adversary to the general population. Due to the fluid and dynamic nature of stability operations, commanders and their staffs are often overwhelmed with details and can quickly reach information overload. The JFC and supporting units, multinational forces, and local officials and law enforcement personnel must have access to continuously updated situational depictions of the operational environment in order for them to be effective. In this type of environment, written products are less likely to be used unless they are of critical importance. Therefore, the JIPOE effort in support of stability operations will be graphic intensive and use techniques that can easily and rapidly update and summarize *relevant* aspects of the operational environment. The following discussion describes some of the specific types of information relative to stability operations and IW that should be considered during the JIPOE process. Techniques for graphically depicting this information are illustrated in Appendix D, "Specialized Products."

a. **Defining the Operational Environment.** The transition from traditional war to nontraditional missions may be blurred in that the stability phase may begin in some liberated areas under US or coalition control prior to conclusion of hostilities. Therefore, stability operations can and will occur across the range of military operations. They can also occur in response to natural or man-made disasters, outside the context of any political or military conflict.

(1) JIPOE in support of stability operations and IW places a heavy emphasis on the identification and evaluation of unforeseen obstacles to mission accomplishment. In addition to establishing a secure environment, a mission of the joint forces during stability operations may be to help set the conditions for effective governance. There may be numerous obstacles presented by the operational environment to setting



conditions conducive to effective governance that do not involve use of violence against the joint force or the civilian authorities. Nonetheless, these obstacles must be identified by JIPOE analysts and considered by the JFC during operation planning.

(2) During stability operations and IW, the single most important aspect of the operational environment will usually be the civil population. The role of the JIPOE analyst is to anticipate natural and human impediments to fulfilling the joint mission. There are instances in which the mission will be opposed by groups or individuals using political or violent means of resistance. In other cases, the population will welcome outside assistance but the geography, climate, infrastructure, or nature of the mission itself will present challenges that must be anticipated and overcome. The JIPOE process in support of nontraditional missions will necessarily involve the identification and complex examination of all relevant factors – environmental and human – that help define the operational environment.

**b. Describing the Impact of the Operational Environment.** The JIPOE effort during stability operations should be focused on detailed analysis of all the relevant cultural aspects previously described, and should portray the current state of government services, transportation system, LOCs, public utilities, finance, communication, agriculture and food distribution, healthcare, and commerce. In doing so JIPOE analysts are able to determine what exists versus what does not exist. The analyst can then recommend what is most critical immediately and over time, and enable commanders to tailor operations according to the situation. In addition to the types of templates and overlays discussed earlier, JIPOE products supporting stability operations may include graphic depictions of infrastructure status and demographic/cultural characteristics of the operational environment. These graphic products are a key visualization aid for commanders and their staffs, and should be designed with the perspective of the joint force mission in mind. For instance, during a mission in support of a natural disaster, such as a flood or earthquake, overlays should be produced depicting the condition of existing road and rail infrastructure and locations of displaced persons.

**c. Evaluating the Adversary.** The term “adversary” must be understood to mean a party, groups or individuals, potentially hostile, who may interact with the joint force and could potentially hamper mission accomplishment. During stability operations and IW, the adversary may range from loosely organized networks or entities with no discernible hierarchical structure to highly structured organizations with centralized C2. Regardless of structure, the adversary must usually rely on the civil population for its sustainment – a critical vulnerability that may be exploited within the country’s interconnected systems. This type of adversary often wages a protracted conflict in an attempt to break the will of the nation-state and sometimes employs tactics (such as terrorism) that may alienate the civil population. During stability operations, threats to completion of the mission can also come from a variety of physical, environmental, or sociocultural factors.

(1) In an effort to create a secure and stable environment it is imperative to be able to identify and understand the characteristics of the remaining military threat in the realm of conventional military forces, unconventional military forces, local militias,



weapons, facilities and sustainment means being used, evolving chains of command, and influence on the local population. The JIPOE process must articulate the hostile forces both internal and external to the targeted country, to include their tactics, objectives, and key leaders.

(2) The identity and general uniformity of a military threat is often absent in a stability operation. When potential violent groups exist in the operational area, the environment becomes even more complex with rapidly shifting, self-proclaimed group titles, multiple memberships by individual terrorists or cells, and blurred connections between groups, political movements, and communities. In many cases, the adversary is described in terms of individuals or small cells that are disaffected and prone to violence. These individuals may be hybrid terrorists and criminals that use illicit activities to finance terrorist activities in support of political goals. The roles of private organizations, such as contract security personnel, NGO service providers, indigenous neighborhood associations, religious communities, and other local actors must also be assessed.

(3) In addition, the potential criminal threat must be assessed. JIPOE analysts must determine who the criminals are, how they are organized, where they are located, and what their historical patterns of activity were. Beyond organized crime and its associated hierarchy, methods, and focus, the JIPOE effort should address what the environment will look like for crime following combat operations. For example, what are the needs and shortages of the local population that will drive crime and who are the likely targets? What will be the likely targets of looting? What are the capabilities of local police?

d. **Determining Adversary Courses of Action.** The weaker opponent that exists in most IW and stability situations will usually seek to avoid large-scale combat and will focus instead on small, stealthy, hit-and-run engagements and possibly suicide attacks. The weaker opponent also could avoid engaging the superior military forces entirely and instead attack nonmilitary targets in order to influence or control the local populace. An adversary using IW methods typically will endeavor to wage protracted conflicts in an attempt to break the will of their opponent and its population. IW typically manifests itself as one or a combination of several possible asymmetric approaches including insurgency, terrorism, disinformation, propaganda, organized criminal activity (such as drug trafficking), strikes and raids, and the use of WMD. The specific form will vary according to the adversary's capabilities and objectives. IW focuses on the control of populations, not on the control of an adversary's forces or territory. Adversary COAs may not be solely directed against US, coalition, or HN *military* forces, but may be directed more toward the sociological, governance, economic, and technological elements of a nation. Discerning these types of nonmilitary COAs presents a unique challenge to JIPOE analysts and requires a comprehensive appreciation for how all the relevant aspects of the operational environment interact with one another.

## SECTION B. COUNTERING ASYMMETRIC APPROACHES

*“Asymmetric warfare—attacking an adversary’s weaknesses with unexpected or innovative means while avoiding his strengths—is as old as warfare itself. In the modern era, many forms of asymmetric attack are possible—to include ... terrorism, guerilla operations, and the use of WMD [weapons of mass destruction]. Because of our dominant military position, we are very likely to be the focus of numerous asymmetric strategies...”*

**Lieutenant General Patrick M. Hughes, US Army**  
***Global Threats and Challenges: The Decades Ahead, 1998***

### 8. Overview

Adversaries are likely to use asymmetric approaches as a method of degrading or negating support for military operations or the military dominance of friendly forces. Adversary asymmetric approaches may include activities such as camouflage and concealment, MILDEC, hardening and burying targeted infrastructure, CNA, propaganda, terrorism, insurgency, and the use or threatened use of WMD, theater missiles, and innovations such as improvised explosive devices. Several types of joint force activities and operations are applicable to deterring, mitigating, or countering an adversary’s use of asymmetric approaches. JIPOE support to these types of joint force activities may require a slightly different focus than that described in previous chapters. Although the basic four-step JIPOE process remains the same, each activity will require detailed information relating to its own unique set of requirements. The following information, although not all inclusive, provides examples of some of the factors that should be considered when applying the JIPOE process in support of joint force activities capable of countering asymmetric approaches (see Figure IV-2).

### 9. Adversary Measures to Avoid Detection

The adversary may use asymmetric means to counter friendly ISR capabilities and complicate friendly targeting efforts through MILDEC, camouflage and concealment, frequent repositioning of mobile infrastructure, and the selective use of air defense systems to force airborne ISR assets to less than optimum flight profiles. For example, Serbian forces in Kosovo made extensive use of camouflage, concealment, and decoys to mitigate the effectiveness of allied air strikes during Operation ALLIED FORCE. JIPOE helps to counter the effectiveness of these asymmetric techniques by supporting the joint force’s ISR and targeting efforts. JIPOE support to ISR is designed to optimize the employment of ISR and target acquisition assets by forecasting the times and locations of anticipated adversary activity. Additionally, ISR collects the information required to update the joint force’s JIPOE products. ISR is therefore both a consumer and provider of JIPOE data.

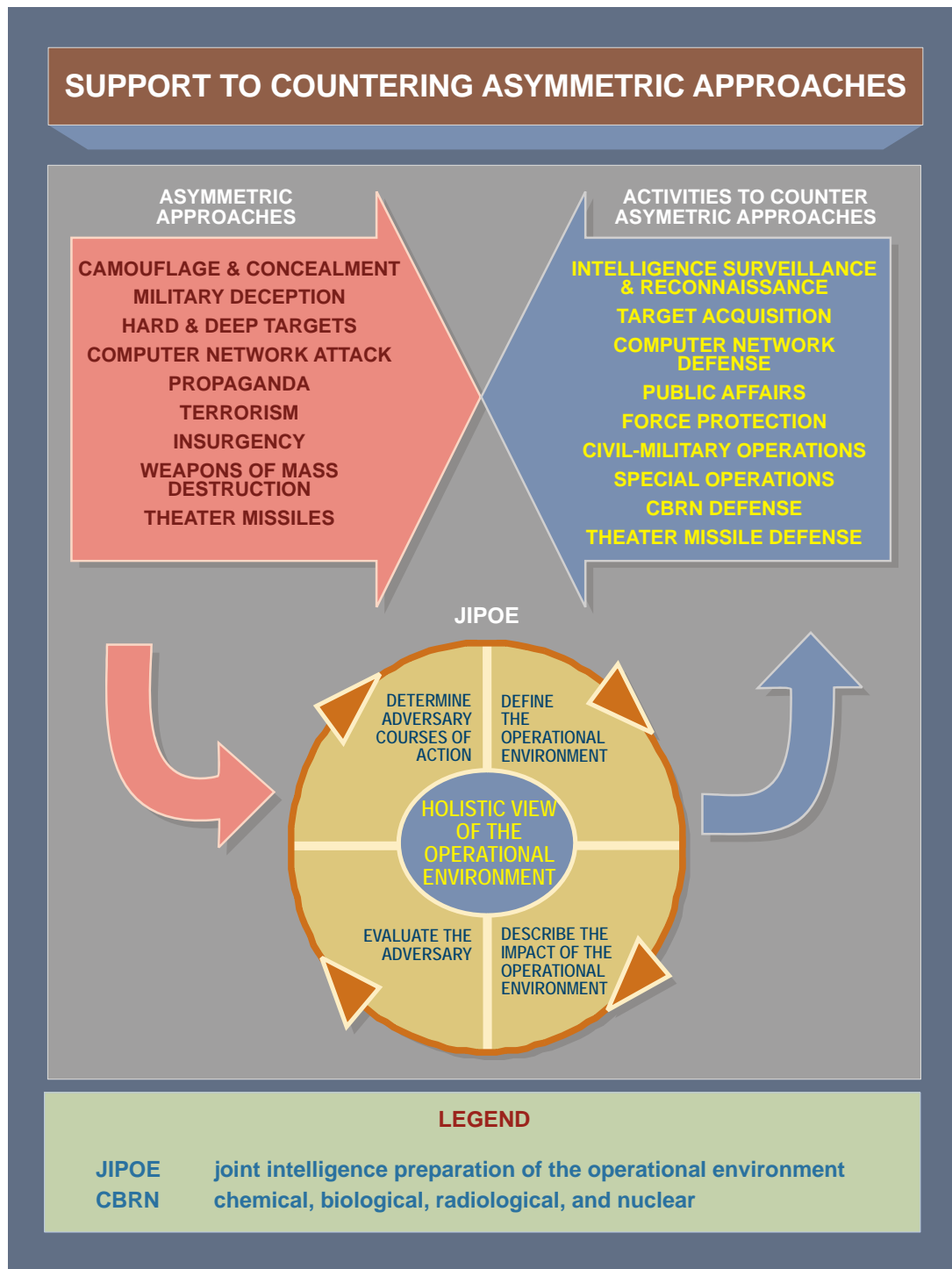


Figure IV-2. Support to Countering Asymmetric Approaches

a. **Define the Operational Environment.** The operational environment must encompass all aspects relevant to adversary capabilities to counter friendly ISR and target acquisition efforts. Conversely, the JIPOE effort must also include all aspects and measures that would increase the efficiency of friendly ISR and target acquisition assets. In addition to the locations of all adversary military forces, the operational environment should include the following:

(1) Potential airfields, supporting infrastructure, and optimum locations in the operational area capable of supporting friendly ISR and target acquisition operations.

(2) Adversary or third-nation air defense envelopes and antisatellite launch locations;

(3) Areas of known or probable underground facility construction.

(4) Actual and potential sources of intelligence or information (e.g., third party nations, internet sites) available to the adversary regarding friendly ISR capabilities, schedules, and flight profiles.

**b. Describe the Impact of the Operational Environment**

(1) Identify and analyze potential deployment locations for land-, air-, and sea-based ISR assets. Consider factors such as:

(a) Location of ISR targets vice the range of ISR assets;

(b) Accessibility to the ISR site;

(c) Optical and radio line of sight from the ISR site to adversary locations;  
and

(d) Defense against rear area threats.

(2) Locate obstacles to ISR operations such as:

(a) Areas with good natural camouflage and concealment;

(b) Objects that may interfere with ground, airborne, and naval ISR operations, such as high power transmission lines, jungle vegetation, buildings, mountains, reefs, sandbars, defensive obstacles, and barriers; and

(c) Widespread non-adversary military, commercial, and civilian use of radio frequencies.

(3) Evaluate how environmental conditions will affect both friendly and adversary ISR systems. Consider how extreme temperatures, winds, humidity, dust, cloud cover, atmospheric conditions, and electromagnetic storms will affect:

(a) Sensitive electronic equipment and antennas;

(b) Flight operations of ISR airborne platforms;

(c) Line of sight observation for optical, infrared, millimeter wave, and other sights and sensors; and

(d) Imagery resolution and radio frequency propagation.

(4) Assess the adversary's capability to relocate underground, or disperse to remote areas, critical infrastructure and military assets (e.g., factories, storage depots, aircraft, theater missiles).

(5) Determine those areas where the effectiveness of adversary air defense systems is optimized.

(6) Identify areas where adversary air defense systems are least effective due to factors such as terrain masking or ground clutter.

(7) Locate all subsurface facilities (subways, tunnels, mines, overpasses) of potential use to the adversary in relocating or hiding mobile targets.

c. **Evaluate the Adversary.** Analyze the standard OB factors for each adversary unit, concentrating on how the adversary will appear to friendly ISR systems.

(1) Identify signatures for specific adversary units and items of equipment.

(2) Analyze the adversary's capability, techniques, and procedures for conducting camouflage, concealment, and MILDEC.

(3) Assess the adversary's normal state of OPSEC.

(4) Analyze the adversary's potential use of air defense assets in new or innovative ways to locate and destroy friendly ISR assets.

(5) Construct adversary templates identifying locations where the adversary is most likely to deploy military HVT and HPT at each phase of specific COAs.

(6) Analyze hard and deeply buried targets for points of vulnerability to precision munitions.

d. **Determine Adversary Courses of Action.** Identify and analyze adversary COAs that could directly affect friendly ISR operations, such as:

(1) Attacks on friendly ISR assets located in the JSA;

(2) Specific types of lethal and nonlethal operations to counter friendly ISR (e.g., SOF, global positioning system denial, CNA, lasers, CBRN); and

(3) Reallocation of adversary air defense units or MILDEC assets to areas previously vulnerable to friendly ISR operations.

## 10. Adversary Use of Information Operations

An adversary is likely to use information-related approaches to counter US advantages in C2, information processing, and decision making, and to reduce public and international support for military operations. JIPOE supports IO and activities by identifying adversary capabilities, vulnerabilities, and strategies and influencing friendly public opinion and decision making.

*For further information regarding IO and public affairs see JP 3-13, Information Operations and JP 3-61, Public Affairs.*

**a. Define the Operational Environment.** The general characteristics of the operational environment, as it pertains to IO, will vary depending on factors such as the following:

- (1) The capabilities and geographic reach of the friendly and adversary information gathering systems;
- (2) The sources of information upon which friendly and adversary forces base significant decisions;
- (3) The capabilities of friendly and adversary information processing, transmission, reception, and storage systems; and
- (4) The strategic goals, political motivations, and psychological mindset of the targeted country or group.

**b. Describe the Impact of the Operational Environment.** The physical, informational, and cognitive dimensions of the information environment could impact both friendly and adversary forces and should be analyzed in order to:

- (1) Evaluate existing and potential impediments to the flow of information required to support the decision-making process.
- (2) Identify and evaluate critical nodes in information collection, processing, and dissemination systems.
- (3) Determine the characteristics and vulnerabilities of specific C2 and ISR systems.
- (4) Evaluate the level of adversary and friendly OPSEC and communications security discipline.

(5) Assess to what degree the values, beliefs, and motivations of key adversary population groups and military forces coincide or conflict with those of political leaders or may influence decision making.

(6) Identify potential vulnerabilities of friendly forces to specific types of adversary propaganda themes or disinformation.

(7) Assess the effectiveness of PSYOP products in the operational environment.

### **c. Evaluate the Adversary**

(1) Identify and assess adversary capability to conduct computer network operations to include defense, exploitation, and attack.

(2) Identify adversary propaganda themes and techniques for exploiting friendly and international public opinion.

(3) Identify potential “key communicators” that could be used by the adversary to influence friendly public opinion or decision making.

(4) Identify and prioritize significant sources of information and decision-making criteria used by friendly decision makers.

(5) Analyze friendly IO related vulnerabilities with attention to factors such as:

(a) C2 network structure vulnerabilities and redundancies;

(b) The susceptibility of friendly ISR systems to MILDEC;

(c) Procedures for shifting to backup systems or making use of another nation’s assets or networks; and

(d) Frequency allocation techniques.

(6) Assess the potential for adversary exploitation of friendly perceptions regarding the political situation, military objectives, and general morale.

### **d. Determine Adversary Courses of Action**

(1) Identify which friendly information systems are most likely to be targeted by adversary information capabilities. Correlate specific adversary information capabilities with indicators of other likely adversary activity (e.g., special operations, sabotage, conventional attacks).

(2) Postulate how the adversary will exploit any loss or degradation of specific friendly information systems at critical junctures during an operation.



(3) Identify likely adversary propaganda messages and/or themes (e.g., misinformation, disinformation, or other public information disseminated to negatively influence public opinion about US and partner/coalition operations).

## 11. Terrorism

Adversaries may commit terrorist acts against US Service members, civilian employees, family members, facilities, and equipment in an attempt to demoralize US forces and counter public support for military operations. JIPOE helps combat terrorism by supporting force protection measures, CI, and other security related activities. Combating terrorism consists of actions, including antiterrorism (defensive measures taken to reduce vulnerability to terrorist acts) and counterterrorism (actions taken directly against terrorist networks and indirectly to influence and render global environments inhospitable to terrorist networks), taken to oppose terrorism throughout the entire range of possible threats.

a. **Define the Operational Environment.** The operational environment, relative to combating terrorism, may involve an area larger than that associated with traditional types of operations. Since the operating area for some terrorist groups may not be restricted geographically, the AOI pertaining to the terrorist threat to the joint force may be worldwide.

(1) Identify the locations and communications networks of adversary terrorists and supporting nations, groups, or organizations, as well as the likely targets of such forces (such as friendly military housing units, transportation networks, and rear area installations).

(2) Consider which terrorist groups are most likely to attack friendly personnel, equipment, and assets. Determine where they are normally based, and what third parties may provide them with sanctuary and support (training, logistics, etc.).

(3) Anticipate how additional missions such as a noncombatant evacuation operation (NEO) may affect force protection.

### b. Describe the Impact of the Operational Environment

(1) Identify the stated and unstated strategic goals or desired end state of terrorist leaders.

(2) Determine the demographic issues that make protected areas or personnel attractive as potential terrorist targets.

(3) Evaluate the potential for terrorist attack on infrastructure targets such as local sources of drinking water, stockpiles of supplies, arms depots, transportation systems, communications infrastructure, and electrical power facilities.

(4) Assess the vulnerability of specific targets to attack. Consider both physical security issues and time constraints that might limit the availability of a target to terrorist attack.

(5) Identify probable avenues of approach as well as infiltration and exfiltration routes.

### **c. Evaluate the Adversary**

(1) Analyze the strengths and weaknesses of terrorist ISR capabilities against force protection-related targets. Determine all available sources of the adversary's information.

(2) Assess the degree of risk the terrorist group is willing to take in order to attack various types of force protection targets. Determine which types of targets the adversary considers most valuable.

(3) Identify the goals, motivations, political or social grievances, dedication, and training of terrorist groups. Evaluate how these factors may affect target selection.

(4) Identify the adversary's preferred methods of attack such as bombing, kidnapping, assassination, arson, hijacking, hostage taking, maiming, raids, seizure, sabotage, or use of WMD.

(5) Assess any variations in terrorist organization, methods, and procedures that may be unique to specific types of terrorist actions (e.g., ambushes, assassinations, bombing, hijackings).

(6) Determine how and from where the adversary receives external support.

### **d. Determine Adversary Courses of Action**

(1) Identify the adversary's most likely targets by matching friendly vulnerabilities against adversary capabilities, objectives, and risk acceptance.

(2) Assess the status of specific types of terrorist support activities that may indicate the adoption of a specific COA.

(3) Identify likely terrorist activity along infiltration routes, assembly areas, and surveillance locations near each of the adversary's likely objectives.

## **12. Insurgency**

In order to counter US advantages in conventional forces, an adversary may support insurgencies in other countries or in response to an occupation of their country. Insurgents may use tactics ranging from terrorism to small or intermediate size

unconventional attacks. In addition to supporting conventional forces, JIPOE analysts help support specialized joint force counterinsurgency activities such as special operations and CMO. Special operations encompass the use of specially organized, trained, and equipped units to achieve military, political, economic, or psychological objectives by unconventional military means in hostile, denied, or politically sensitive areas. Special operations can be used to counter asymmetric threats by attacking or neutralizing adversary targets that may be inappropriate for engagement by conventional means alone. Due to the high level of physical and political risk involved, special operations require extremely detailed JIPOE products. CMO are the activities of a commander that establish, maintain, influence, or exploit relationships between military forces and civil authorities, both governmental and nongovernmental, and the civilian populace in a friendly, neutral, or hostile operational area to facilitate military operations and consolidate operational objectives. Effectively executed CMO are capable of countering potential asymmetric threats, such as attempts by the adversary to incite hostility toward friendly forces, or to use crowds, demonstrations, or dislocated civilians (DCs) to hinder friendly military operations.

a. **Define the Operational Environment.** The AOI for special operations and CMO should encompass:

- (1) Infiltration and exfiltration routes and corridors;
- (2) Insurgent communications means and methods;
- (3) Areas or countries that provide military, political, economic, psychological, or social aid to the target forces or threats to the mission;
- (4) Military, paramilitary, governmental, and NGOs that may interact with the friendly force;
- (5) The extent to which international law constrains special operations and CMO activities both during and after hostilities;
- (6) Sources of food and water, pattern of population distribution, and locations of critical infrastructure; and
- (7) The attitudes of the population toward US and friendly forces and toward civil government in general.

b. **Describe the Impact of the Operational Environment**

(1) Evaluate how METOC affects SOF capabilities to conduct infiltration and exfiltration operations, with particular attention to factors such as the following:

- (a) Surface and upper air winds on SOF airborne, aerial leaflet, and loudspeaker operations;

(b) Benefits of clouds and low visibility on SOF air operations and special reconnaissance;

(c) Extreme temperatures, humidity, or sand on SOF personnel, aircraft, and other equipment;

(d) Tides, currents, and sea state as well as water temperature and bioluminescence on waterborne operations; and

(e) Illumination.

(2) Analyze the electromagnetic environment for its effect on SOF communications.

(3) Assess how the attitudes, values, and motivations of the civil populace will facilitate or constrain CMO activities. For example, nationalism or religious beliefs may cause the population to resent or resist certain types of CMO activities.

(4) Analyze the attitude of the local populace toward the existing or pre-hostilities civil government. Assess how this may affect CMO activities conducted through or in conjunction with local civil officials.

(5) Survey the extent of damage to local infrastructure, estimate the level of infrastructure capacity required to support the populace (including additional DCs), and determine if local sources of repair materials are sufficient.

(6) Estimate how and where the weather and environment might help or hinder insurgent forces. For example, drought may exacerbate food shortages, while flooding may increase the number of DCs and create shortages of shelter. These factors may help insurgents recruit additional members but could also reduce their access to necessities.

### **c. Evaluate the Adversary**

(1) Assess the capabilities and procedures of the insurgent's military, political, and internal security forces.

(2) Evaluate the organizational structure and procedures of all groups supporting the insurgents.

(3) Identify the motivations and potential sources of discord within the insurgent force.

**d. Determine Adversary Courses of Action**

(1) Identify how the adversary will attempt to counter special operations or CMO missions. Determine to what degree the adversary's likely response will include political, economic, social, or military countermeasures.

(2) Assess the insurgent's capability to secure all identified infiltration and exfiltration routes. Determine to what degree the adversary's strengthening of internal security in one area will detract from security in a different area.

(3) Postulate how the civil populace is likely to respond to various types of CMO activities, and how insurgents may attempt to leverage or exploit such responses. For example, the adversary may attempt to use propaganda against a vaccination program or try to gain control over food distribution centers.

(4) Consider the effect that the insurgent's perception of friendly forces may have on COA selection. If friendly forces appear overwhelmingly powerful, non-confrontational COAs may be preferred, whereas the appearance of weakness may invite insurgents to pursue higher risk COAs.

**13. Actual or Threatened Use of Weapons of Mass Destruction**

The actual or threatened development, proliferation, or employment of WMD by an adversary can impact friendly forces by causing those forces to prepare for or conduct WMD nonproliferation, counterproliferation, or consequence management operations. JIPOE analysts help mitigate this threat by assessing the adversary's potential proliferation or employment of WMD, characterizing the consequences of a WMD-related activity, and supporting the joint force's WMD defense effort. The potential for accidental or deliberate release of CBRN agents within the operational area is also a major JIPOE analytic concern.

**a. Define the Operational Environment.** With regard to WMD, the operational environment should encompass the following:

(1) All adversary countries or groups as well as potential belligerents known or suspected of possessing a WMD capability and their intent or commitment to using it;

(2) All current and potential locations of adversary and potential belligerent WMD delivery systems (e.g., missiles, artillery, aircraft, mines, torpedoes, and forces).

(3) All adversary known and suspected CBRN agents, nuclear capabilities, and their storage and production facilities;

(4) Nontraditional threats and targets;

(5) Unconventional weapons or materials capabilities (e.g., nanotechnology, biotechnology, advanced genetics, space-based capabilities, and advances in computing that allow actors more efficient access to information or production techniques); and

(6) Proliferation of WMD material, capabilities, expertise, and sensitive technologies.

### **b. Describe the Impact of the Operational Environment**

(1) Identify and assess the vulnerability of key friendly logistic facilities and infrastructure to WMD attack.

(2) Identify all known and suspected chemical and biological agents.

(3) Identify critical weather and terrain information needed to determine the effects of weather on the use of WMD. Analyze the seasonal or monthly normal variations in weather patterns that might affect the use of WMD.

(4) Analyze the land and maritime surface dimensions to identify potential target areas for WMD attack, such as chokepoints, key terrain, and transportation nodes.

(5) Identify state and non-state actors of proliferation concern.

(6) Identify WMD material, capabilities, expertise, and sensitive and dual-use technologies.

### **c. Evaluate the Adversary**

(1) Analyze adversary capabilities and will to proliferate and/or employ specific types of WMD. Determine the locations, volume, and condition of adversary WMD materials and stockpiles.

(2) Identify the specific types and characteristics of all adversary WMD delivery systems, with special attention to minimum and maximum ranges.

(3) Evaluate adversary doctrine to determine if WMD employment is terrain oriented, force oriented, or a combination of both.

(4) Assess the level and proficiency of adversary WMD training and protective measures.

(5) Assess the practicality and timeliness of an adversary's exploiting a new or different technology to develop a WMD capability and delivery means.

**d. Determine Adversary Courses of Action**

(1) Identify friendly assets that the adversary is most likely to target for WMD attack.

(2) Determine those locations where the adversary is most likely to deploy WMD delivery systems. These locations should be within range of potentially targeted friendly assets, yet still consistent with the adversary's deployment doctrine.

(3) Evaluate those characteristics of the adversary's WMD stockpile that may dictate or constrain WMD weapons use. These may include factors such as the quantity and yield of nuclear weapons, the age and shelf-life of stored chemical munitions, and the production and handling requirements for biological agents.

(4) Determine types and quantities of CBRN agent likely to be employed by an adversary.

**14. Theater Missiles**

An adversary may use theater ballistic missiles, unmanned aircraft, and cruise missiles to directly threaten friendly forces or to provoke political situations that may have strategic ramifications. For example, Iraqi Scud missile launches against Israeli targets during Operation DESERT STORM were intended to provoke an Israeli attack that could have had negative consequences for the coalition. Theater ballistic missile defense and counterair operations help protect the force from these types of asymmetric threats.

a. **Define the Operational Environment.** The operational environment for theater ballistic missile defense and counterair operations should incorporate portions of the air, land, maritime, and space domains. Consider factors such as the following;

(1) Areas likely to be targeted by adversary theater ballistic or cruise missiles.

(2) Theater ballistic and cruise missile launch locations, potential hide sites, forward operating locations, related locations, garrison locations, and associated infrastructure.

(3) Locations of operational and potentially operational airfields and launch locations.

(4) Range characteristics and flight profiles of adversary theater ballistic and cruise missiles.

(5) Bases, normal operating areas, and ranges of adversary SLCM-capable naval forces.



**b. Describe the Impact of the Operational Environment**

(1) Determine the locations of targets within range of specific adversary missile launch sites or airfields. Analyze the geography between the target and adversary base to determine potential missile trajectories and air avenues of approach for unmanned aircraft and cruise missiles.

(2) Identify areas for likely standoff attack orbits, SLCM launch locations, and aircraft carrier operating areas.

(3) Determine optimal times on target based on weather patterns, adversary launch and attack cycles, and light data.

(4) Determine line of sight from friendly air and missile defense systems and radar.

**c. Evaluate the Adversary**

(1) Assess the adversary's launch procedures, resupply operations, and target selection priorities.

(2) Consider the adversary's demonstrated capabilities, level of training and readiness status, operational cycles, and C2 regime, as well as actual equipment and hardware capabilities.

(3) Evaluate the threat to friendly air defense systems, to include adversary artillery, unconventional forces, and EW assets.

(4) Determine the adversary's requirements for air and missile base infrastructure, navigation aids, and communications system support equipment.

(5) Analyze the characteristics, availability, and quantity of specific types of warheads and launch platforms.

(6) Analyze the adversary's will to launch missiles.

**d. Determine Adversary Courses of Action.** Although the employment flexibility of mobile missiles and modern aircraft make the determination of specific COAs difficult, the JIPOE analyst should postulate how missile operations will support the adversary's joint campaign. Consider factors such as the following:

(1) Likely timing of missile strikes;

(2) Likely targets, objectives, and cruise missile avenues of approach;

(3) Occupation or preparation of forward launch locations;

(4) Strike package composition, ballistic missile flight profiles, distance between launch platforms, and time intervals between strikes; and

(5) Friendly air defense locations and coverage, and their likely effect on adversary missile operations.

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## APPENDIX A

### THE LEYTE CAMPAIGN — A CASE STUDY OF SUPPORT TO MAJOR OPERATIONS AND CAMPAIGNS

*"In considering the enemy's possible lines of action, the commander must guard against the unwarranted belief that he has discovered the enemy's intentions, and against ignoring other lines of action open to the enemy."*

1941 edition of Army Field Manual 100-5, *Operations*

#### 1. Operational Background

a. By the summer of 1944, the Allied offensive against Japan had reached a crucial decision point (see Figure A-1). The Allies had conducted a two prong strategic offensive in the Pacific during the previous year. As part of his island hopping campaign in the central Pacific, Admiral Nimitz, Commander in Chief, Pacific Ocean Area (CINCPOA), conducted landings in the Gilberts, Marshalls, Carolines, and Marianas, with landings in the Palaus scheduled for September 1944. Meanwhile, General MacArthur, Commander in Chief, Southwest Pacific (CINCUSOPAC) drove west along the New Guinea coast with landings at Morotai and Mindanao scheduled for mid-September and mid-November 1944, respectively.



Figure A-1. Pacific Theater Situation September 1944

b. The next objective would merge the two drives as the Allied offensive completed its goal of isolating Japan from its source of oil and seizing advanced bases in preparation for the eventual invasion of the Japanese home islands. The question was whether Formosa (followed by a landing on the Chinese coast) or the northern Philippines should be the objective of the coming offensive. Nimitz favored the Formosa strategy, while MacArthur favored the recapture of all of the Philippines. The debate centered on a number of points, to include: the potential for higher casualties in the Philippines; a friendly and supportive native population in the Philippines vice Formosa; the recent loss, due to the summer Japanese offensive, of Allied air bases in mainland China (for attacking Japan); and the political imperatives for recapturing the Philippines, an American possession. The debate was essentially decided in favor of the Philippine strategy during a meeting in Hawaii among President Roosevelt, General MacArthur, and Admiral Nimitz on 26-27 July. By early September, a target date for a landing on Leyte had been set for 20 December 1944 to be followed by landings on heavily defended Luzon in February.

c. In early September, Admiral Halsey, Commander Third Fleet, conducted a series of carrier air strikes in the Philippines in preparation for the upcoming landings in the Palaus. The limited Japanese response to his attacks resulted in Halsey's sending a message to Admiral Nimitz on 13 September recommending that the intermediate landings on Mindanao, the Palaus, Morotai, and Yap be canceled as unnecessary and the timetable for the landing at Leyte be accelerated to mid-October. Within 48 hours, after a flurry of message traffic between Nimitz, MacArthur's Headquarters, and the Joint Chiefs of Staff, the landings on Mindanao and Yap were canceled. The landings in the Palaus and Morotai were retained to obtain forward naval and air bases. The date for the landing on Leyte was advanced to 20 October 1944. The forces of the two combatant commanders (CINCPAC and CINCSOWESPAC) would be combined to conduct the operation.

## 2. JIPOE Analysis

### a. The Operational Environment Defined

(1) **Mission Analysis.** The landing at Leyte was to be the first step to retaking the Philippines. Leyte would be seized in order to establish a centrally located air and logistic base from which the recapture of the rest of the Philippines, to include the heavily defended northern island of Luzon, could be accomplished. Control of the Philippines, especially Luzon, would enable the Allies to cut Japanese SLOCs, which ran through the South China Sea, and deny Japan access to its primary source of crude oil in the East Indies. US aircraft based in the Philippines would reinforce ongoing submarine operations and completely sever this vital supply link. Finally, the Philippines would provide an advanced base to support the eventual invasion of Japan. Japanese forces deployed outside the Philippines that were capable of interfering with the mission included: aircraft based in China, Japan, Okinawa, and Formosa; the surface fleet based at Singapore; and the carrier fleet based in Japan.

(2) **Boundaries.** Given these considerations, the joint operations area (JOA) extended in an approximate 1,500-mile radius, centered on Leyte, from southern Japan to the north, the Asian mainland (Japanese held) to the west, New Guinea (Allied held) to the south, and the Marianas (Allied held) to the east. The JOA cut across two US theaters of operation, MacArthur's Southwest Pacific Area (the supported command) and Nimitz's Central Pacific Area (the supporting command). MacArthur's operational area for the Leyte landing was the Philippine Archipelago, centered on the objective (the island of Leyte), its surrounding waters, and accompanying air space.

#### b. The Impact of the Operational Environment

(1) **Maritime Domain.** The Philippine Archipelago, which extends for over 1,000 miles from north to south, restricted naval operations in the otherwise open ocean environment of the Western Pacific. It separated the Philippine Sea to the east from the South China Sea to the west. The Philippine Archipelago, Formosa, and the Ryukyu Islands formed a physical barrier that protected SLOCs linking the East Indies (present day Indonesia) and China with the Japanese home islands via the South China and East China Seas. There were only four maritime avenues of approach for naval formations transiting the Philippine Archipelago from the South China Sea to the Philippine Sea: (1) north of Luzon; (2) the San Bernardino Strait; (3) the Surigao Strait; and (4) south of Mindanao (see Figure A-2). Additionally, within the South China Sea there were areas of water along the Philippine Archipelago that were unnavigable due to uncharted rocks and shoals, further constraining maritime operations. While the Philippines would serve to channelize naval operations, they could also provide concealment from enemy observation for smaller ships (amphibious shipping, coastal freighters, patrol boats, etc.) hugging the extensive coastline. The large number of widely dispersed potential amphibious landing sites along the Philippine coast severely complicated the viability of ground defenses. Finally, the Philippines had a number of fine natural harbors that supported a thriving network of interisland trade and commerce. Since road networks on some islands were limited, interisland shipping was the primary means of moving bulk cargoes. Leyte Gulf provided sheltered waters large enough to accommodate an extremely large amphibious task force, and was capable of protecting shipping from the effects of bad weather (see Figure A-2). Its deep water approaches to the east made it easily accessible from the Philippine Sea, while the adjacent land mass restricted maritime avenues of approach from the north, south, and west. The eastern approach to Leyte Gulf was protected by Japanese naval minefields and was dominated by two small islands south of the gulf's mouth.

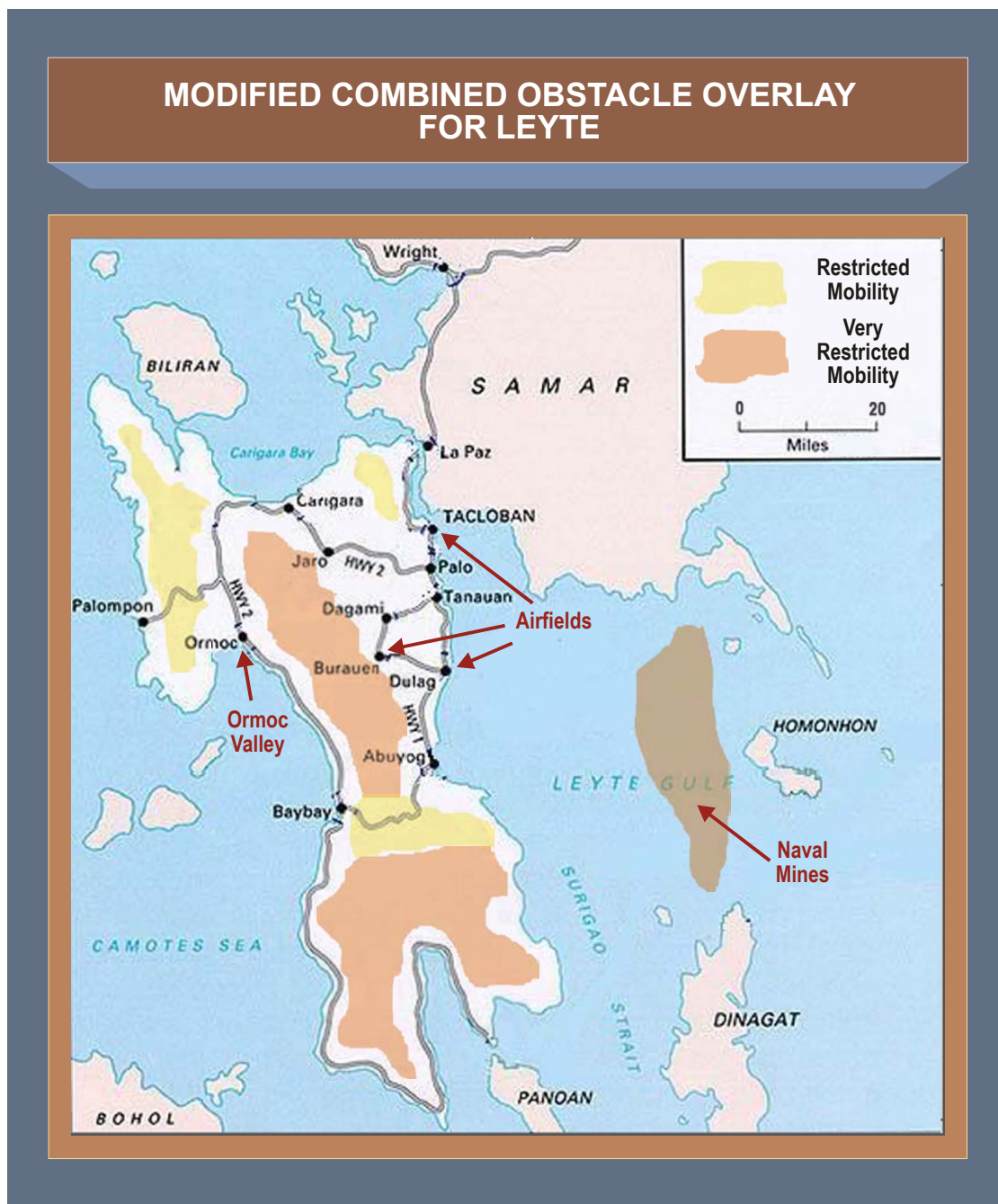
(2) **Air Domain.** In 1944, the Philippines contained an extensive network of over 100 operational airfields (ranging from grass strips to fully developed air bases). Thus, the network of airfields could be used to supplement maritime inter-island transport as well as disperse combat aircraft to multiple bases within range of Leyte. Additionally, the Philippines served as an island "ladder" linking New Guinea with Formosa, the Ryukyus, and the Japanese home islands. Thus, the network of airfields could be used to deploy aircraft and transport supplies south and east from Japanese-controlled territory (Formosa, the Ryukyus, Japan, and the Asian mainland), or north and west from Allied-



**Figure A-2. Modified Combined Obstacle Overlay for Philippines**

controlled territory (Morotai, New Guinea, the Marianas, and Palau). Three airfields (Dulag, Buraun, and Tacloban) were within several miles of the Leyte amphibious landing site. If captured, these airfields could be used to support US land-based aircraft.





**Figure A-3. Modified Combined Obstacle Overlay for Leyte**

(3) **Land Domain.** The island of Leyte dominated the central portion of the main Japanese LOC connecting the strategic islands of Luzon and Mindanao. Leyte's exposed eastern coastline offered excellent beaches to support an amphibious landing and the subsequent offloading of supplies. The adjacent coastal plain, the Leyte Valley, held the majority of the island's 900,000 native population, along with most of the towns and roads. The terrain within the Leyte Valley favored offensive operations. Additionally, it would provide the space necessary to establish the base infrastructure needed to support follow-on operations in the Philippines. The island, which was only 50 miles wide at its greatest width, was dominated by a heavily forested north-south central mountain range

of up to 4,400 feet in height. Consequently, Japanese forces based in the mountains could threaten any build-up in the Leyte Valley. The west side of the island contained the Ormoc Valley and the port of Ormoc City. However, the remainder of the western side of the island was mountainous, sparsely populated, and had poor land LOCs. The terrain in the west favored defense, while the port of Ormoc City offered a resupply point for Japanese reinforcements arriving by sea from nearby islands. Thus, to secure control of the vital Leyte Valley, the entire island would have to be captured.

(4) **Weather.** The tropical weather found year-round in the Philippines, with its autumn monsoon rains, would significantly impact military operations. It could seriously hamper land mobility and the rapid construction of bases and supporting logistic infrastructure. This could be critical as carrier-based air power would be forced to remain close offshore supporting the landing force and protecting it from air attack, until land-based air power could be established in strength on Leyte. This would rob US aircraft carriers of one of their primary strengths — mobility — by fixing them in place, making them more vulnerable to attack.

#### (5) **Nonmilitary Aspects of the Operational Environment**

(a) Politically, the recapture of the Philippines was important in that it would demonstrate that the United States was willing to sacrifice to meet its obligations to an Asian people. It would be physical proof that, while the Philippines had been lost at the beginning of the war, the United States had not abandoned the Philippine people. This would be an effective counter to Japanese propaganda of “Asia for the Asians” and help to encourage opposition to the Japanese in other occupied Asian nations. It would also be a crucial aspect to establishing the US position in post-war Asia. With respect to the upcoming battle, it would mean that the sixteen million people of the Philippines would be friendly to US forces and actively support the landings through resistance activity.

(b) The Japanese leadership was desperate to achieve a tactical victory against the United States, or at least to inflict unacceptably heavy losses on US forces. It was hoped, perhaps unrealistically, that a limited victory could be used as leverage to open the door to peace negotiations.

(c) For Japan, the importance of the continued flow of crude oil from the East Indies could not be overstated. It was access to oil that was the *casus belli* for Japan and directly led to the attack on Pearl Harbor. Japan was already suffering a shortage of fuel because of aggressive submarine attacks on its SLOCs to the East Indian oilfields.

c. **Evaluation of the Adversary.** The Japanese 14th Area Army was responsible for defending the Philippine operational area with a total of 432,000 troops (with between 180,000-200,000 on Luzon) and over 800 aircraft (from the 4th Air Army and 1st Air Fleet) (see Figure A-4). The 35th Army was assigned to defend the Visayas (including Leyte) and Mindanao. This included the 16th Division (controlling approximately 20,000 troops), which was responsible for defending Leyte, and the 30th Division,

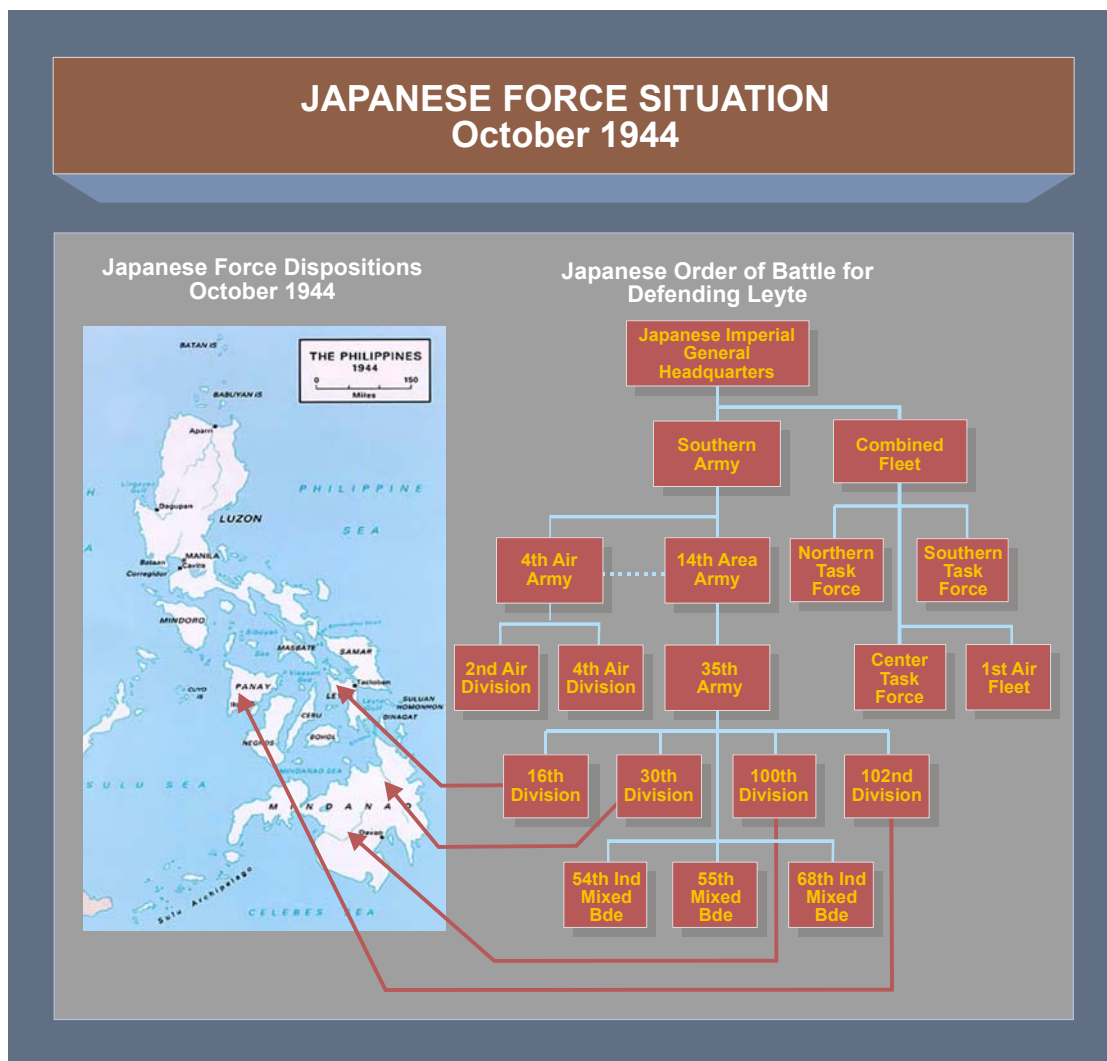


Figure A-4. Japanese Force Situation October 1944

located nearby on Mindanao. As early as April 1944, Japanese forces began constructing additional defenses on Leyte as one of several anticipated US landing sites. Additional Japanese aircraft (Army and Navy) were located on Okinawa, Formosa, and Japan. The Japanese aircraft carriers were also located in Japan in order to train replacements for their badly attrited air crews. The remainder of the Japanese surface fleet was anchored off Singapore at Lingga Roads due to the shortage of fuel in Japan.

d. **Determination of Japanese Courses of Action.** The Japanese end state was to retain control of their SLOCs between Japan and the East Indies as well as to inflict unacceptable damage and casualties upon US forces in the hopes of opening peace negotiations. Operational Japanese objectives were to retain control of the Philippines, destroy or severely damage US forces, and defeat the amphibious operation.

(1) Based upon Japanese objectives and the disposition of Japanese forces immediately following the landing, broad Japanese COAs included the following:

(a) **COA 1. Defend Leyte with the forces on hand** (see Figure A-5). Past Japanese practice, as well as their military doctrine, made this COA likely. However, given the immense superiority of US military power in the area of operations, this COA would only delay an inevitable Japanese defeat, albeit at a cost to the United States in the form of casualties.

### SITUATION TEMPLATE FOR COURSE OF ACTION 1 (DEFENSE OF LEYTE)



Figure A-5. Situation Template for Course of Action 1 (Defense of Leyte)

(b) **COA 2. Reinforce land forces on Leyte and committed air units in the Philippines** (see Figure A-6). This COA would enable the Japanese to prolong the battle, increase US casualties, and/or prepare for a future attack. However, given US air and naval superiority, Japanese forces would suffer severe attrition as they moved en route to Leyte, thus increasing Japanese losses, while at the same time enabling the US buildup on Leyte to continue.



Figure A-6. Situation Template for Course of Action 2 (Reinforcement of Leyte)



(c) **COA 3. Attack in order to disrupt the landing and isolate the landing force** (see Figure A-7). While Japanese land forces on Leyte were too weak to conduct a full-scale ground offensive without reinforcement, Japanese air and naval units could conduct offensive operations to destroy US naval forces off Leyte. This would isolate the landing force and facilitate its subsequent destruction by a (reinforced) ground offensive. Japanese naval doctrine of the decisive battle argued for this COA. However,



Figure A-7. Situation Template for Course of Action 3 (Decisive Attack)

Japanese naval forces had been severely attrited (especially their carrier air crews) and had not recovered from their defeat at the Battle of the Philippine Sea. As a result, this COA risked the permanent destruction of Japanese naval power. Neither MacArthur nor Nimitz considered this COA likely, due to the weakened state of the Japanese Navy.

(d) COA 4. Withdraw from Leyte to consolidate on Luzon (see Figure

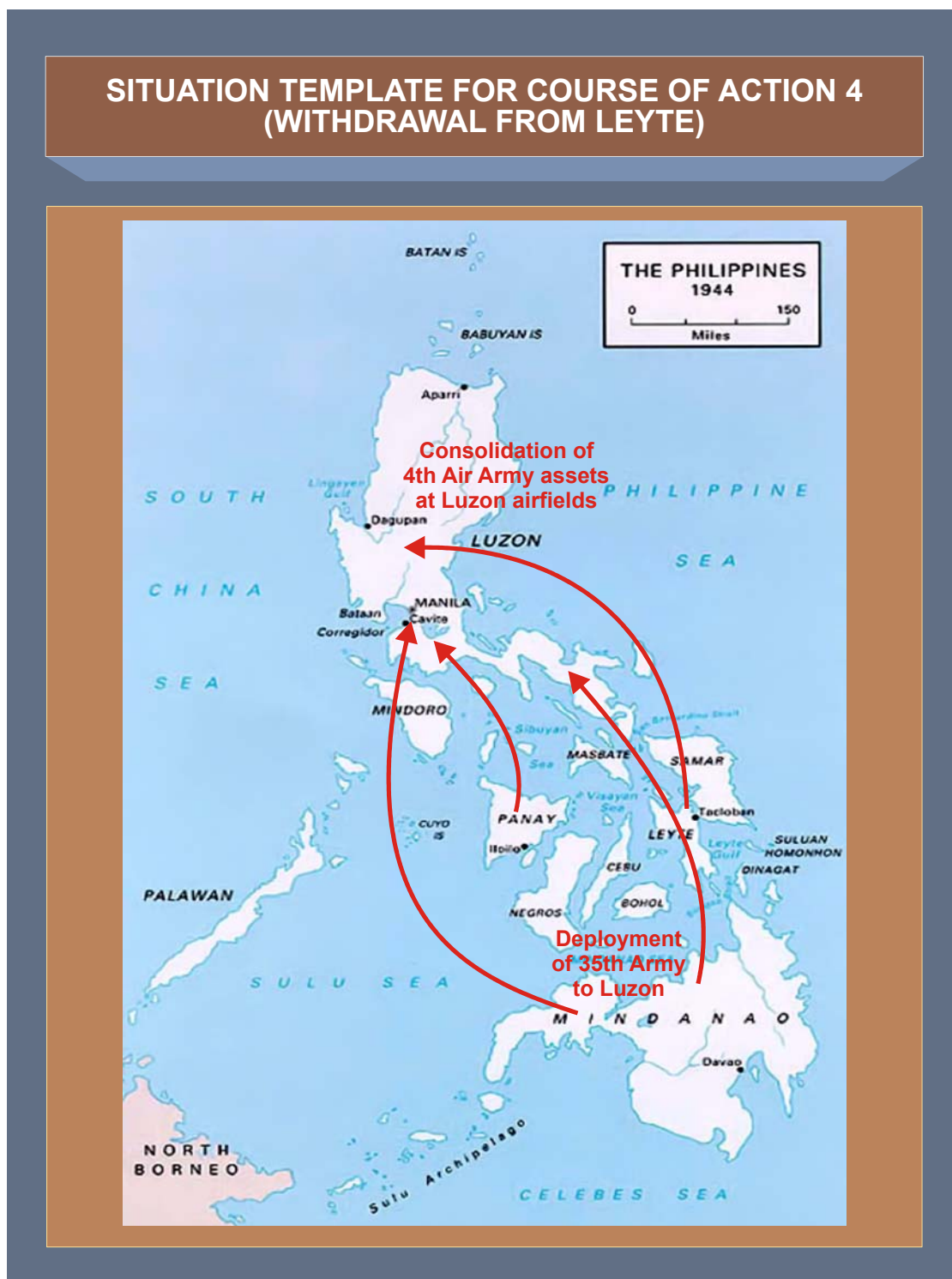


Figure A-8. Situation Template for Course of Action 4 (Withdrawal from Leyte)



A-8). This COA would enable the Japanese to conserve combat power in order to defend Luzon, the most important island in the Philippines. However, this COA would also enable the United States to establish a significant base on Leyte, thus endangering Japanese control of the Philippines and the SLOCs between Japan and the East Indies.

(2) **Analysis of COAs.** Based upon doctrine, relative force ratios, past practice, and the Japanese cultural mindset, COA 1 (to defend Leyte with the forces on hand) was considered the most likely. However, such a defense would only delay defeat and was unlikely to achieve Japanese objectives unless it was augmented by elements of the other COAs. COA 2 (to reinforce Leyte with additional land and air units) was a medium risk and medium gain means of augmenting the defensive COA. COA 3 (a counteroffensive), although a high risk and high gain option, was the only COA capable of fully meeting the

JAPANESE COURSE OF ACTION MATRIX				
JAPANESE COURSES OF ACTION (COAs)				
	COA 1	COA 1	COA 3	COA 4
MISSION	Defend	Reinforce	Attack	Delay and withdraw
OBJECTIVE	Attrition	Prolong attrition Future operations	Decisive battle	Conserve power
GROUND FORCES	Defend Leyte with forces on hand in decisive battle of attrition.	Same as COA 1 and reinforce Leyte with troops based in Philippines and China. Goal of prolonging battle of attrition.	Same as COA 2 but with goal of conserving and/or building up combat power for future offensive operations.	Withdraw from Leyte. Consolidate on Luzon.
AIR FORCES	Engage with aircraft already assigned to Philippines. Conserve air strength for future battles.	Same as COA 1 and reinforce committed air units with aircraft from Formosa, China, Okinawa, and Japan.	Reinforce as in COA 2 and conduct all-out attacks. Goal of supporting naval attack and isolating beachhead.	Same as COA 1 but with goal of supporting withdrawal of ground forces from Leyte.
NAVAL FORCES	Avoid combat with surface fleet. Use land-based naval air to support air attacks.	Same as COA 1 plus transport ground forces to Leyte and provide land-based naval air to support air attacks.	Engage US naval forces with all available naval and naval air forces in accordance with decisive battle doctrine.	Support of withdrawal of ground forces from Leyte.

Figure A-9. Japanese Course of Action Matrix

desired Japanese end state and objectives. A counteroffensive was also the most dangerous Japanese COA for US forces, but was not considered likely by the United States because of the risks involved and the weakened state of the Japanese Navy. COA 4 (a withdrawal from Leyte) was the least likely option based upon past Japanese practice and the strategic significance of Leyte. Figure A-9 summarizes these COAs in the order of their projected probability of adoption.

(3) **Event Template and Matrix.** The following event template (Figure A-10) combines the hypothetical NAI portrayed on the situation templates associated with each of the COAs identified above. The event matrix (Figure A-11) lists the indicators for each NAI that would confirm Japanese intentions to adopt a specific COA.

### 3. The Battle of Leyte Gulf

a.. The United States gained air and naval superiority in the immediate vicinity of Leyte following a series of devastating carrier and land-based air strikes on targets in the Philippines, Okinawa, and Formosa. On 20 October 1944, the US Seventh Fleet began landing the US Sixth Army at Leyte Gulf, while the US Third Fleet (including the fast carrier striking force) provided the covering force protecting the amphibious operation (see Figure A-12). The US Fifth Air Force provided long-range air support for the operation from bases in Morotai and New Guinea and was preparing to deploy to airfields on Leyte as soon as they were secured.

b. The Japanese, despite significant aircraft losses, believed that they had inflicted severe damage upon the US Third Fleet during its preparatory carrier air strikes on Japanese airfields in Formosa, Okinawa, and Luzon in the month prior to the landing. In response to the US invasion of the Philippines, the Japanese chose to adopt COA 3 and executed a previously prepared counterattack plan known as SHO-1, designed to destroy the US fleet in a single decisive action. The Japanese aircraft carriers (nearly combat ineffective due to inexperienced aircrews) would sortie from Japan and be used as a decoy to lure the US Third Fleet away from Leyte Gulf. The Japanese surface fleet would then attack and destroy the amphibious task force (US Seventh Fleet) off Leyte, thus isolating the landing force (US Sixth Army). The attack would be supported by the remaining Japanese aircraft (army and navy) based in the Philippines, Formosa, and Okinawa using both conventional and kamikaze tactics. Meanwhile, Japanese ground forces would reinforce Leyte and prepare to counterattack the US landing force as soon as the amphibious task force had been destroyed.

c. The Japanese carrier task force (northern force) under Admiral Ozawa was not limited by military geography, and approached on an axis moving south southwest from Japan into the Philippine Sea. This northern force was to act as a decoy by threatening the US carrier striking force and drawing it away from Leyte.

d. In order to attack the amphibious task force, which was located to the east of Leyte, the Japanese surface fleet had to transit through the Philippine Archipelago (see Figure A-12). The surface fleet was organized into two task forces that would constitute

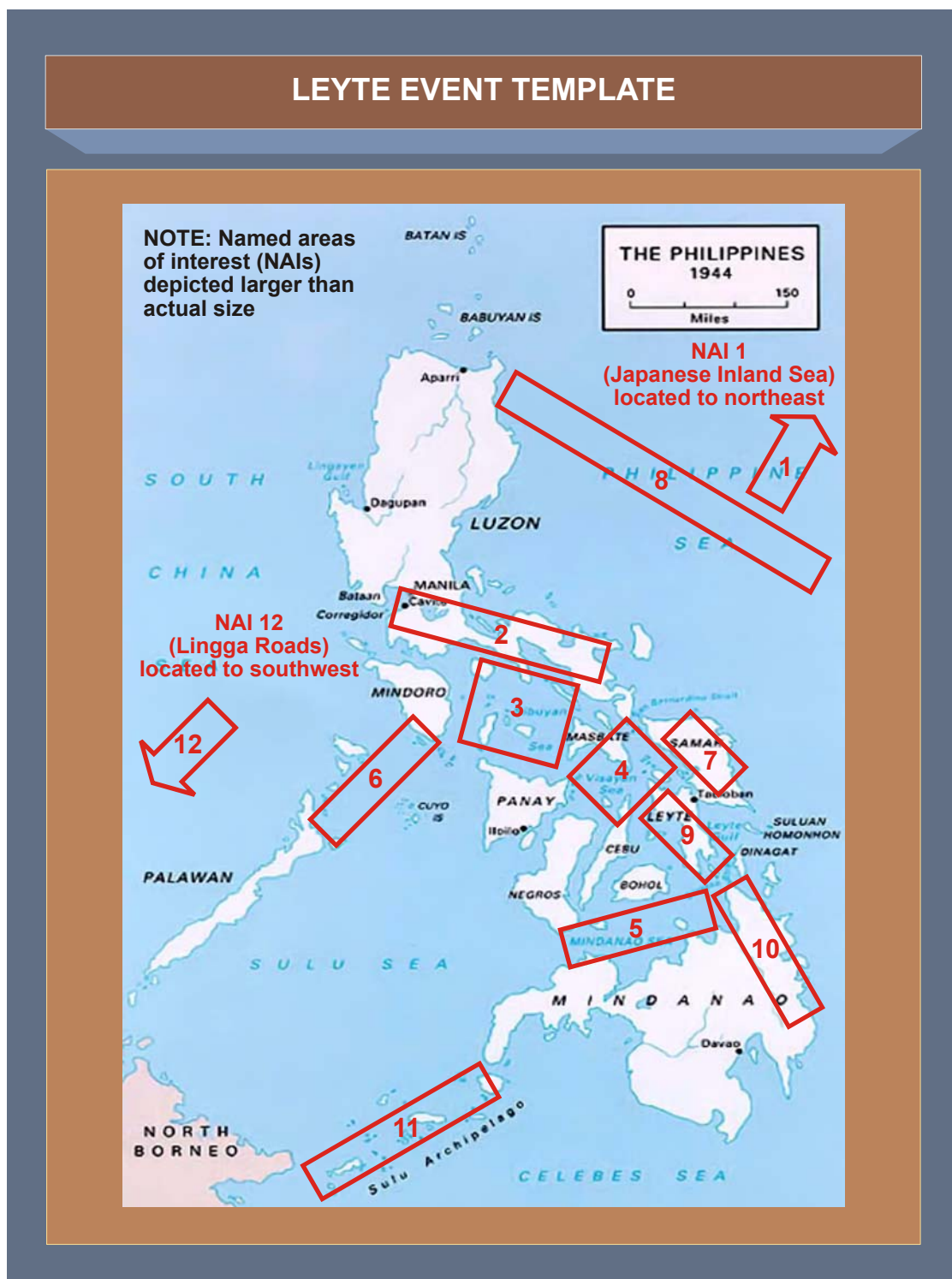


Figure A-10. Leyte Event Template

the center and southern forces of the overall Japanese strategy. The center task force, under the command of Admiral Kurita, would use San Bernardino Strait to the north of Leyte. The southern task force, under the command of Admiral Nishimura, would use Surigao Strait south of Leyte. A smaller third task force of surface ships (Admiral

LEYTE EVENT MATRIX				
NAMED AREAS OF INTEREST	EVENT	TIME		INDICATES COA
		EARLIEST	LATEST	
1	Carriers depart Japanese Inland Sea.	D+1	D+8	3
2, 9	Additional aircraft redeploy to Leyte.	D+1	D+5	1
2	Troop transports depart Luzon.	D+2	D+7	2
3, 4, 5	Troop transports move to Leyte.	D+1	D+7	2
3, 4, 5	Presence of major surface combatants.	D+4	D+8	3
6	Eastward transition of major surface combatants.	D+3	D+7	3
7	Ground force movement from Leyte.	D+2	D+7	4
8	Southward movement of aircraft carriers.	D+4	D+8	3
9	Preparation of additional defensive positions.	D+0	D+4	1
9	Departure of ground troops from Ormoc.	D+2	D+7	4
10	Ground force movement to Leyte.	D+1	D+4	2
10	Evacuation of ground forces to Luzon.	D+1	D+8	4
11	Eastward transit of major surface combatants.	D+5	D+8	3
12	Surface combatants depart Lingga Roads.	D+1	D+5	3

**Figure A-11. Leyte Event Matrix**

Shima's 2nd striking force), which had sailed prior to the battle from Japan, was to follow the southern task force through Surigao Strait.

e. Kurita's center force was detected and heavily damaged by submarine attacks and Third Fleet carrier air strikes on 23 and 24 October. This force was observed to reverse



**Figure A-12. Leyte Gulf Situation October 1944**

its course as a result of these attacks. At the same time, the Seventh Fleet positioned its battleships and cruisers to defend Surigao Strait from the approach of the two southern task forces. Meanwhile, Ozawa's northern force, with its decoy carriers, was detected in the Philippine Sea. Admiral Halsey, believing reports that the Japanese center force had turned back, responded to what he perceived to be the most dangerous threat by moving Third Fleet northwards to attack the Japanese carriers. This left the San Bernardino approach uncovered, the 6th Army beachhead on Leyte vulnerable, and the amphibious task force in Leyte Gulf virtually unprotected.

f. During the night of 24-25 October, the Seventh Fleet destroyed both Nishimura's southern force and Shima's 2nd striking force in a surface action known as the Battle of Surigao Strait. Meanwhile, to the north of Leyte, Kurita's center force reversed course a second time, transited San Bernardino Strait during the night, and was approaching Leyte Gulf unopposed. On the morning of 25 October, Kurita's force encountered Seventh Fleet escort carriers and destroyers off Samar. The thin skins, lack of armament, and slow speed of the escort carriers (converted merchant ship and tanker hulls), made them sitting ducks for Kurita's rapidly approaching force. Nevertheless, following two and a half hours of desperate surface combat the Japanese center force (which became disorganized and confused during the engagement) turned back, believing it had sunk a number of fleet carriers and cruisers vice escort carriers and destroyers. Kurita's

confusion proved to be the salvation of the defenseless US amphibious task force. Meanwhile, Third Fleet, which was out of range and unable to support the escort carriers off Samar, launched a series of air strikes throughout the day and sank Ozawa's northern force carriers in the Battle of Cape Engano, thus permanently destroying Japanese carrier aviation for the remainder of the war.

g. Despite their heavy losses, the Japanese believed that they had achieved a major naval victory. Wildly exaggerated reports of damage from their air attacks and "victory" at the Battle off Samar led them to conclude that the US Sixth Army had now been isolated on Leyte. Using nine convoys between 23 October and 11 December, they reinforced their forces on Leyte by committing elements of five divisions and one independent brigade to the battle. MacArthur's headquarters believed (correctly) that the Japanese had suffered a defeat, and initially thought the purpose of the Japanese convoys was to evacuate vice reinforce Leyte. Once their true purpose was discerned, these convoys were severely attrited by US air attacks. However, the Japanese managed to land over 45,000 troops and prolong organized resistance on Leyte until the end of December.

h. Throughout this period, the US Seventh and Third Fleets had to remain off Leyte to protect the beachhead and the Sixth Army until sufficient airfields could be constructed to enable land-based aircraft to take over the mission. Meanwhile, the Japanese Naval Air Force continued to attack US vessels off Leyte using the suicide or "kamikaze" tactics for the first time. While these attacks added to US Navy losses, the battle had already been decided.

*"Of this plan [SHO-1] it can only be said that it was contrary to every principle of naval tactics. When we could not possess adequate control of the air, to send the main strength of our surface decisive battle force against the enemy landing point, was a flagrant departure from military common sense. However, under the existing circumstances there was no alternative unless, seeking safety in retreat, we were to supinely sit by and watch the enemy carry out his invasion."*

**Admiral Soemu Toyoda, Commander in Chief, Japanese Combined Fleet,  
The End of the Imperial Japanese Navy, 1956**

#### 4. JIPOE Lessons Learned

The Battle of Leyte Gulf sealed the fate of the Japanese Empire. The Japanese Navy was decisively defeated and was incapable of conducting further operations that would endanger US naval superiority. However, the Japanese almost won a major victory with Kurita's center force snatching defeat from the jaws of victory due to its untimely withdrawal. By using this historical example, several important points about JIPOE can be made.

a. Prior to the battle, neither MacArthur nor Nimitz expected a significant offensive reaction from the Japanese Navy. They focused upon what they expected the Japanese to



do (COA 1) vice what the Japanese were capable of doing (COA 3). Additionally, US planners failed to understand the perception of the Japanese leadership (albeit incorrect) that their forces had the advantage due to “heavy” US losses. The JIPOE process, when correctly applied, is designed to focus attention both upon what the enemy is expected to do and is capable of doing, by identifying both the most likely enemy COA and the most dangerous COA.

b. Halsey was vulnerable to deception based upon his belief (backed up by his previous 3 years of war in the Pacific) that the Japanese carriers were the primary threat. In reality, the Japanese carrier-based air threat was negligible due to the heavy losses incurred by Japanese naval aircrews and the lack of sufficient replacements. In JIPOE terms, Halsey failed to anticipate how “wildcard” factors, such as desperation, can modify an adversary’s past practices, such as the use of aircraft carriers as decoys. Caution should always be exercised to avoid over-reliance on adversary templating without rigorous all-source analysis to test if the threat remains valid. The use of a red team by both the J-2 and the commander can help identify other alternative enemy COAs viewed through the adversary’s cultural lens. —JIPOE is not a panacea, and can lead to pitfalls when applied without careful analysis.

c. The US Navy’s defensive problem was made easier because of restrictions imposed by the littoral environment of the Philippine Islands upon Japanese maneuver. The JIPOE process is designed to identify this type of advantage prior to the battle so that it can be exploited. On the other hand, the JIPOE process cannot be expected to identify unknown threats such as the use of new tactics (kamikazes); however, once identified, previously produced JIPOE products can be quickly adapted to address new threats.

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APPENDIX B  
SOMALIA 1992-1993 — A CASE STUDY OF SUPPORT  
TO STABILITY OPERATIONS AND IRREGULAR WARFARE

*“Me and Somalia against the world  
Me and my clan against Somalia  
Me and my family against the clan  
Me and my brother against my family  
Me against my brother.”*

Somali Proverb

## 1. Background

a. By the early 1990s, Somali governmental institutions had completely failed and the Somali people had become fragmented and dependent on foreign aid for basic sustenance. Following the downfall of Somalia’s dictator, Siad Barre, in 1991 chaos ensued in the southern area of Somalia. Civil disorder combined with a devastating drought to bring Somalia to the brink of a humanitarian disaster. Regional warlords established power centers drawing upon clan loyalties, and fought with rival clans for territory and food. Caught in the middle were millions of Somalis who left their flocks and fields and migrated to food distribution centers, further exacerbating the food shortage. Aid shelters were set up by international NGOs to forestall the growing humanitarian crisis. As the civil war deepened in 1992, some warlords began to use food as a source of power, choosing to steal or burn NGO stockpiles at warehouses in the territory of rival clans. Furthermore, since food was a valuable commodity, Somali criminal elements pilfered NGO food supplies for profit. The resulting insecurity and lawlessness caused many of the NGOs to reduce operations in Somalia, further deepening the crisis.

b. Exacerbating the situation was the extent to which the country was awash with arms that had been provided to the Barre regime by the former Soviet Union. Additionally, Somalia hosted one of the most active illegal arms markets in Africa. Available weapons included vintage heavy weapons such as tanks and armored personnel carriers, antiaircraft artillery, and shoulder-fired infrared-guided surface-to-air missiles. Additionally, small arms, mortars, rocket propelled grenades, small caliber antiaircraft artillery, towed artillery, machine guns, and trailer-mounted multiple rocket launchers were prevalent. “Technicals” (jeeps and light trucks indigenously modified to mount machine guns, light antiaircraft artillery pieces, or recoilless rifles) were common and owned by most clan militias. Technicals added mobility and firepower to the clan militia arsenal, and were often used as a terror weapon against hostile clans or rival militias. Additionally, over a million mines had been emplaced by the various clans to shield off their territory.

c. In the UN, Secretary General Boutros-Ghali urged the UN Security Council to provide for protection of food distribution centers and transportation hubs throughout the country. In April 1992, the UN General Assembly established UN Operations Somalia (UNOSOM) and authorized a humanitarian support mission under Chapter VI of the UN

Charter with 50 UN observers to monitor a tenuous ceasefire among the warring factions. The UN monitors took almost 90 days to arrive, however, and by that time the ceasefire had all but disintegrated. When UNOSOM arrived, only a handful of NGOs remained in Somalia. Many of the remaining NGOs used locally-hired guards to protect food storage houses, a practice that paradoxically undermined security. The locals that were hired owed allegiance to one warlord or another, and would inevitably aid their clan in stealing food at the expense of other clans. This situation caused the clans that were left out to be even more determined to thwart the aid effort.

d. In July, a US effort to airlift 28,000 tons of food and supplies directly to airfields in the interior of the country in coordination with UNOSOM briefly improved the situation, but looting and banditry continued to take a toll on the remaining relief organizations. At most, only 40 percent of the food delivered actually reached the intended population. Similarly, 500 Pakistanis airlifted to Mogadishu by the US were unable to open lines of communications from the port facility due to armed opposition. In the face of these obstacles and the deepening humanitarian crisis, on 25 November 1992 President Bush authorized the use of a large US-led mission. The UN General Assembly approved resolution 794 on 3 December creating the UN Unified Task Force (UNITAF) – known in the US as Operation RESTORE HOPE – and authorized it, under chapter VII of the UN Charter, to “use all necessary means to establish a secure environment for humanitarian relief operations in Somalia as soon as possible.”

## 2. Joint Intelligence Preparation of the Operational Environment – The Process

Although a formal JIPOE process did not exist at the time, US forces operating with UNITAF conducted an extensive IPB effort that included both geospatial and systems perspectives. This analysis provided a holistic view of the operational environment and laid the groundwork for sound, subjective advice to the RESTORE HOPE commander.

### a. Define the Operational Environment

(1) **Mission Analysis.** Commander, US Central Command stood up Joint Task Force (JTF) RESTORE HOPE on 3 December 1992. The JTF became the core element of UNITAF, a 21 nation coalition involving approximately 37,000 soldiers. The first UNITAF contingent arrived in Mogadishu on 10 December and established a headquarters at the former US Embassy. By the fall of 1992, an estimated 1.5 million Somalis were internally displaced persons (IDPs) and at risk of death from disease and famine. Major IDP camps were located in large towns as shown in figure B-1. An additional 300,000 Somalis were in refugee camps outside Somalia proper. The JTF commander, attempting to bound the task, established the primary mission as:

## INTERNALLY DISPLACED PERSONS CAMP LOCATIONS



Figure B-1. Internally Displaced Persons Camp Locations

(a) Provide logistic and security support to NGOs engaged in providing relief supplies to internally displaced populations;

(b) Secure Mogadishu port and airfield;

(c) Secure lines of communications into the interior of the country for relief supplies to traverse; and

(d) Provide security escorts for relief supply convoys. After establishing control, the JTF commander intended to turn over operations to the UN and withdraw. The JTF purposefully deemphasized military operations against potential belligerents. Discussions with local warlords revealed that the warlords would not oppose an expanded humanitarian relief effort, but would view negatively an outside intervention in their political struggles.

(2) **Boundaries.** Somalia is a long, narrow country located on the Horn of Africa. It has a total land area of 246,200 square miles, making it slightly smaller than Texas (see figure B-2). It has a 36-mile border with Djibouti in the northwest, a 994-mile

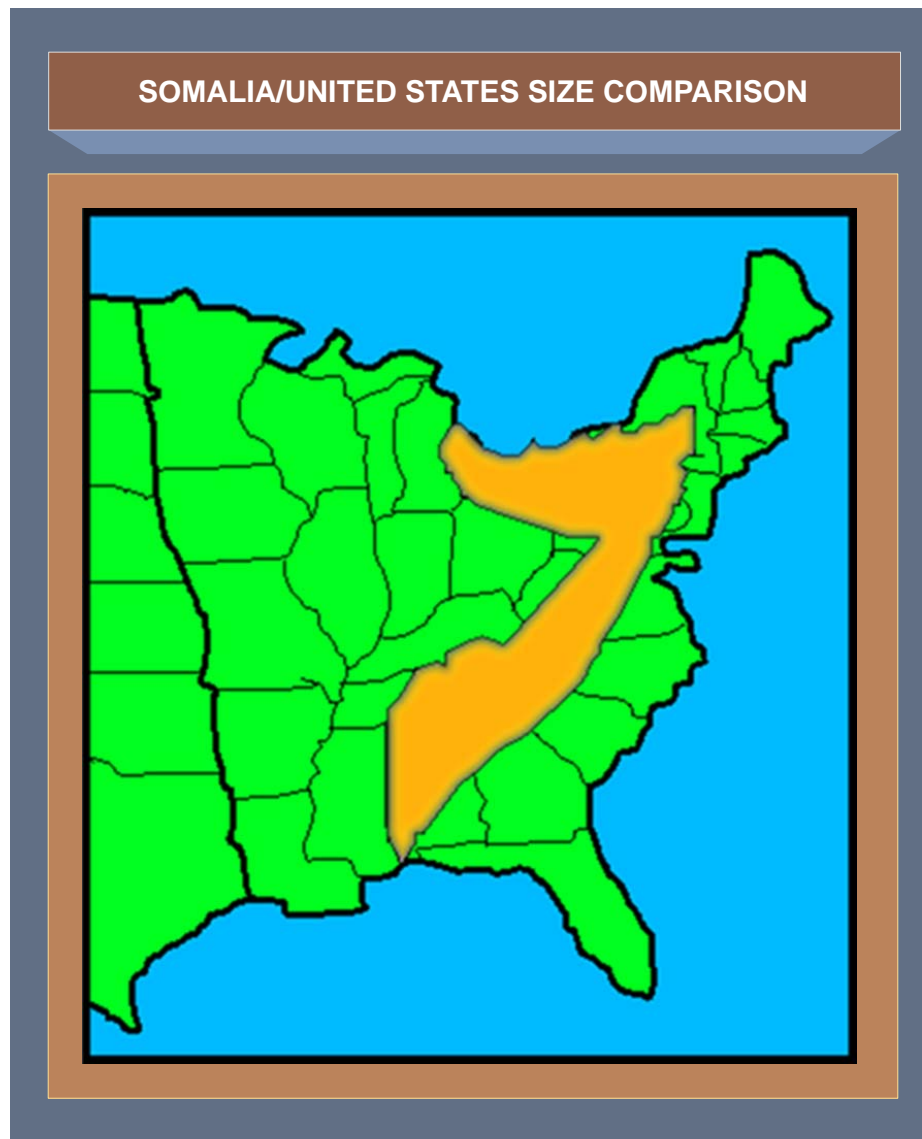


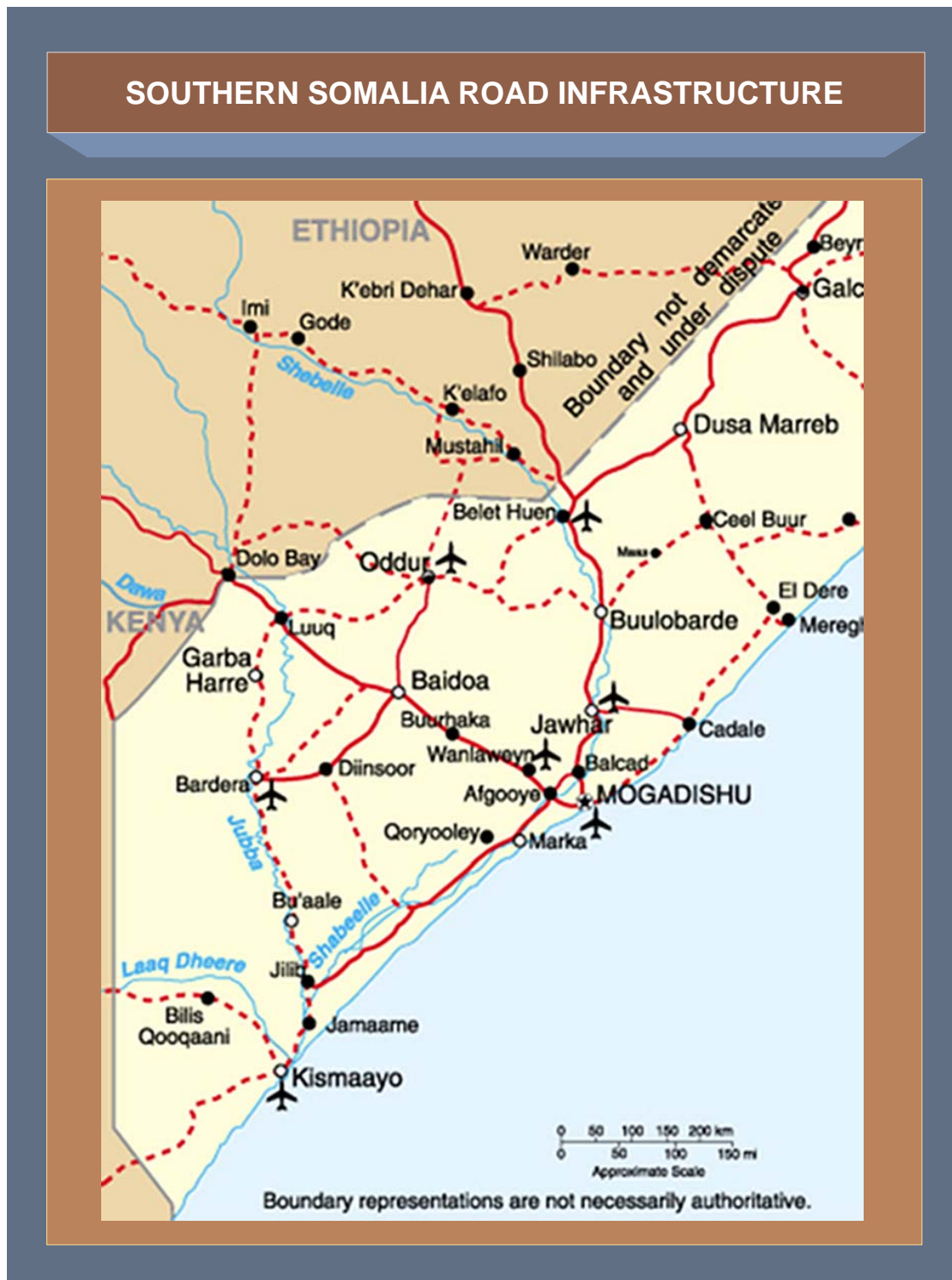
Figure B-2. Somalia/United States Size Comparison

border with Ethiopia to the west and northwest, and a 424-mile border with Kenya in the southwest. To the east, Somalia borders on the Indian Ocean, and to the north it borders on the Gulf of Aden. Its coastline is 1880 miles long, which is nearly as long as the US Atlantic Coast (2069 miles).

**b. Describe the Impact of the Operational Environment**

(1) **Land Domain.** Somalia is a land of few contrasts. Most of the country is desert, and the dominant terrain features are flat plateau surfaces and plains. The only significant mountains are the rugged east-west Karkaar mountain ranges in the far north. Somalia has only two major rivers, the Webi Shabeelle and the Webi Jubba, both of which are in the south. For this reason, the south is home to Somalia's largest sedentary population and the economy is a mixture of agriculture and livestock herding. Northern Somalis are nearly all pastoral nomads or seminomads. This difference caused the prolonged drought and famine of 1991-92 to hit southern Somalia much harder than the north. It also drove the UN to focus its military relief operations in the south. The open, level terrain and clear weather favored operations by heavily armed forces, and this ultimately helped convince the Bush Administration to send ground forces. The biggest problems facing US forces were the standard hardships of desert warfare (see paragraph 2.b.(5) "Weather") and a number of dangerous diseases found in the region. These include bacterial and protozoal diarrhea, hepatitis A and E, typhoid fever, malaria, dengue fever, schistosomiasis, tuberculosis, and rabies. A primary concern for JTF RESTORE HOPE was the ability to transport relief supplies from ports and airfields, where they arrived, to internally displaced populations residing in refugee camps. Somalia had a very poor transportation and communication infrastructure. The ongoing conflict had destroyed much of the country's meager infrastructure. Furthermore, because of continued civil unrest, travel within Somalia was very dangerous. Without a strong central government to fund and oversee restoration, little was rebuilt; roads and airfields remained in poor condition. Somalia's ports and airfields were not under government control; agreements with individual clans had to be secured for use of transportation facilities. Access was subject to intermittent disruption as clans vied for control. In 1991, Somalia had only 1621 miles of paved roads and 12,112 miles of unpaved roads. In contrast, Texas, which is roughly the same size, has over 300,000 miles of roads. Existing roads were underdeveloped, normally very narrow (16 feet wide), and travel required 4-wheel-drive vehicles. Roads connecting the ports with the interior were not well maintained. As shown in Figure B-3, a paved road extended from Mogadishu to Jilib in the south, 80 miles from the major southern port at Kismaayo. Paved roads also ran from Mogadishu through Baidoa to Dolo Bay, and Mogadishu through Buulobarde to Belet Huen in the southern interior of Somalia. An additional paved road extended north to south through the interior of the country from Oddur through Baidoa to Bardera. The remainder of the roads in the hard-hit south were crushed bituminous or graded earth. With the government's fall, the transportation system's quality declined. There was no reliable indigenous transport capability to provide large-scale movement within the country. Compounding the problem, there was no rail infrastructure.





**Figure B-3. Southern Somalia Road Infrastructure**

(2) **Maritime Domain.** There was no organized naval threat in Somalia. The only threats to shipping were militia attacks on ships in port or entering the harbors. The principal maritime concern was a severe lack of port facilities. Somalia has a very long coastline for its size, but it had only three deepwater ports (Berbera, Mogadishu, and Kismaayo) and a few smaller ports. Shore facilities were in generally poor condition, and

ships' crews were required to accommodate all off-load requirements with their own ships' gear. More than 90 percent of international aid to Somalia passed through these three ports. However, given Somalia's instability and clans' failures in managing the ports, security was a concern. The port at Mogadishu, for example, could only handle one ship at a time (see Figure B-4). These limitations seriously impacted NGO relief shipments.

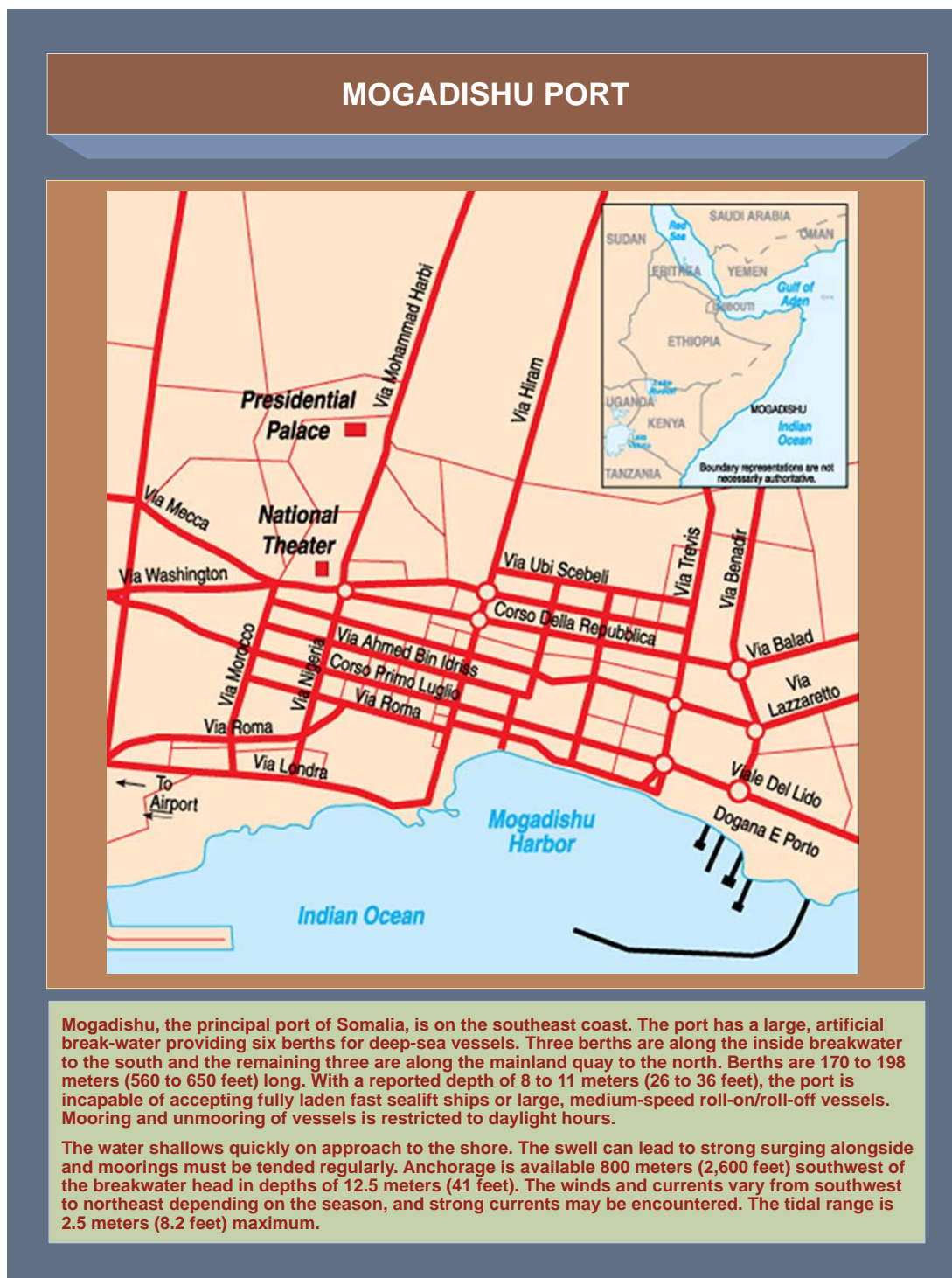
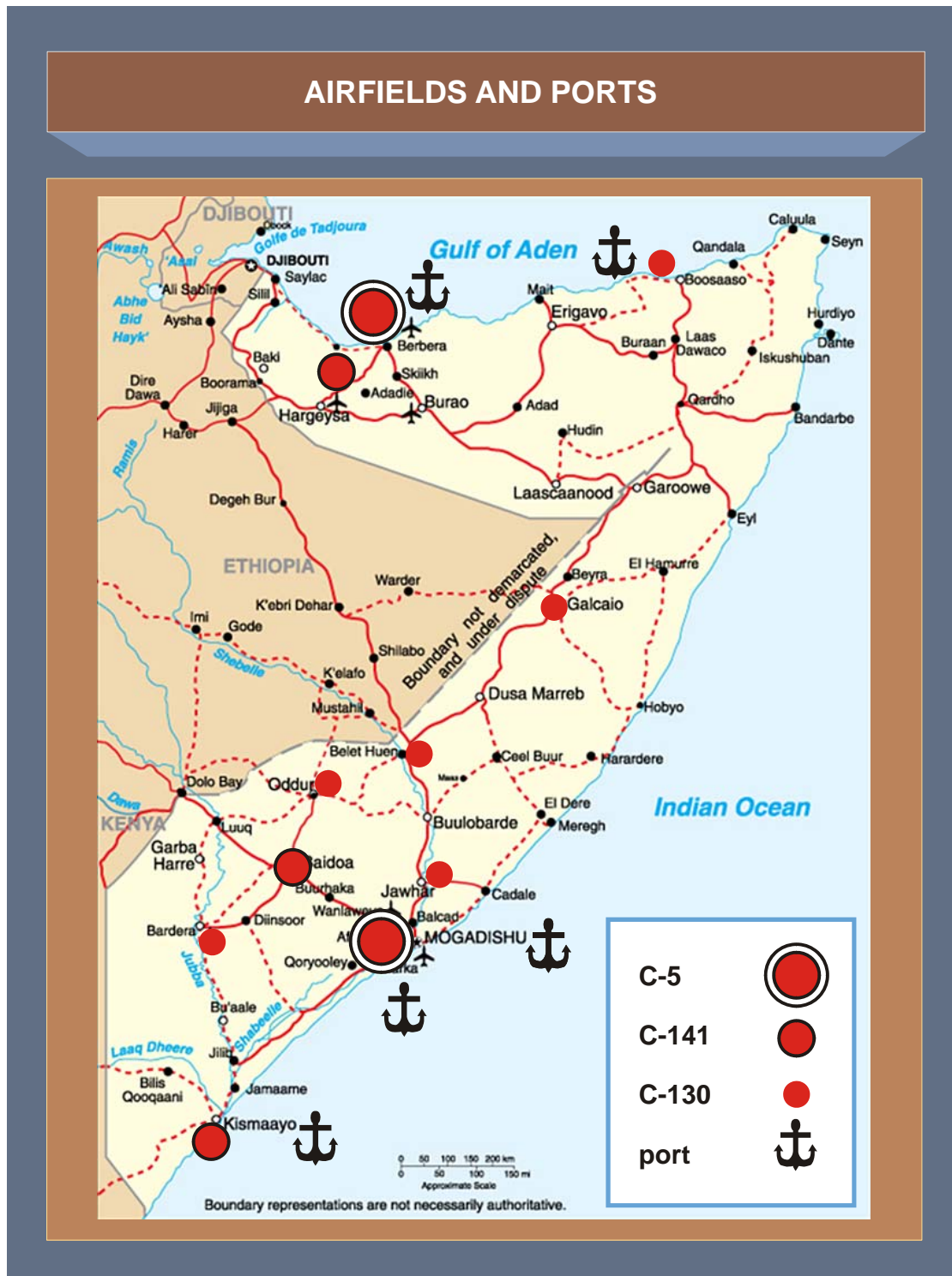


Figure B-4. Mogadishu Port



(3) **Air Domain.** Somalia's air domain resembled its maritime domain. A lack of significant air defenses and the desert climate meant that US airmen would have excellent flying conditions almost year round. The problem for relief operations was a lack of operational airport facilities, air control operations, or cargo handling equipment. On paper, Somalia had eight airports with paved runways and 50 60 more with unpaved strips. In reality, these facilities were in the same condition as the seaports (see Figure B-5). For example, the Mogadishu airport was capable of handling no more than two aircraft at a time. These space limitations were especially dangerous because there was also no centralized airlift control provided for either international relief organizations or US forces. Somalia's degraded airfields also lacked navigational aids to facilitate operations at night and in bad weather. As a result, airlift operations were limited to day/visual flight rules conditions only.

(4) **Information Environment.** By 1991 Somalia literacy rates were extremely low. Only approximately 24 percent of Somalis could read in 1990. An ambitious literacy campaign in the 1970s somewhat improved the historically low literacy rate, but lack of participation by nomadic tribes dampened overall success. Civil strife in the late 1980's further eroded literacy. Furthermore, less than ten percent of Somalis could read English or Italian, so that printed media such as newspapers or leaflets would be required in multiple languages in order to reach any significant number of the target audience. Therefore, most mass communication was carried out over airwaves in either television or radio format. The TV and radio stations in southern Somalia and Mogadishu were dominated by the warring factions. The most active faction on the airwaves was the Somali National Alliance (SNA) under General Mohammad Farrah Aideded. Aideded's SNA had seen the benefit of using mass media to spread its message and coordinate efforts, and had taken over the only TV station in Mogadishu and three radio stations. The United Somali Congress (USC), under Ali Mahdi Mohammad, had retained control of two radio stations in Mogadishu and additional radio stations in regions outside of Mogadishu, including the riverine regions west of Mogadishu and the towns of Baidoa, Oddur, and Belet Huen. Since most Somalis owned radios, and a fairly large portion in the urban areas had access to televisions, the primary means the warring factions had to communicate with the Somali people were through these media. They used radio and television broadcasts to consolidate attitudes in favor of their positions with respect to the international community and other warring factions, and in some cases to spur action by the masses in support of a preplanned action or in response to a particular event. Most infrastructure in Somalia was severely degraded during the civil strife of the late 1980s and early 1990s. This included landline telephone cables and switching stations. The result was that most telecommunications were conducted through a cellphone network which existed primarily in Mogadishu and a few other urban areas. One of the primary uses of the cellphone network by the warring factions was to acquire information from observers and scouts, and to issue orders and instructions to subordinate members. Members of warring factions exhibited a great deal of autonomy in day-to-day operations, but routinely responded to calls for assistance from faction leadership.



(5) **Weather.** As indicated in Figure B-6, Somalia is hot and arid for most of the year. The mean daily maximum temperatures throughout the country range from 85 to 100 degrees Fahrenheit, except in the higher elevations and along the coast. There are four seasons in Somalia, two wet and two dry. The seasons are marked by northeast and

SOMALIA SEASONS			
SEASON	MONSOON PATTERN	CLIMATE	LOCAL NAME
January – March	Northern Monsoon	Hot, Dry, Blowing Dust	
March – May	Lull	Hot, Wet – Harsh period in Southern	“Gu”
June – August	Southwest Monsoon	June – August	
September – December	Lull	Heat and humidity; Intermittent rains	“Dayr”

Figure B-6. Somalia Seasons

southwest monsoon winds and the lulls that occur between them. The first season begins in late December or early January and is marked by hot, dry, and dust-laden northeast monsoon winds. It is considered the harshest season of the year. The second season runs from March to May and is the lull between the monsoon seasons. It is the hottest period of the year in southern Somalia and the period of heaviest rainfall. The third and longest season extends from June through August. The southwest monsoon during this season tempers the climate with cool breezes from the Indian Ocean. The fourth season runs from September through December and is another lull between monsoons. Heat and humidity can be expected along with light intermittent rains. Somalia’s desert climate, combined with its open terrain, provide an ideal environment for military forces to operate either in relief supply distribution or counterinsurgency. The main problem it posed to US forces were those common to all desert areas: extreme heat, lack of water, and blowing dust or sand. No one believed that these would be a “show-stopper” in Somalia. Decades of training on military ranges in the southwestern US and the stunning US victory over Iraq in 1991 left little doubt that US forces could handle desert warfare.

(6) **Sociocultural Factors.** Far more problematic than the geography, transportation infrastructure, or desert climate were the challenges presented to the coalition forces by Somalia’s sociocultural factors.

(a) **Population.** Somalia had an estimated 7.7 million citizens in 1991, not including Ethiopian refugees. About three-fifths of the population were predominantly

nomadic herders; about one-fifth were farmers inhabiting the river areas of southern Somalia; another one-fifth were urban (vast majority in Mogadishu). The urban population of Mogadishu swelled during the civil strife in the late 1980s and early 1990s to approximately two million. The extended drought, civil strife, and famine disproportionately affected these urban dwellers, along with the farmers.

(b) **Ethnic Groups.** Somali society is homogeneous in nature. Ethnic Somalis are united by language, culture, and devotion to Islam. The overwhelming majority of Somalis trace their genealogical origin to the mythical founding father, Samaale or Samaal. Even clan-families, whose members in many cases do not trace their lineage directly to Samaal, readily identify themselves as Somali. Most Somalis outside urban areas are nomadic herders, with the exception of two primarily agricultural clan-families (Digil and Rahanwayn).

(c) **Languages.** Common Somali is most widely used; however, several dialects are spoken. Less than ten percent speak English and Italian. Most university-educated Somalis are familiar with Italian. Arabic is used in religious contexts. Indigenous languages include various dialects of Afar and Boni.

(d) **Religion.** Most Somalis believe they are descendents of noble Arabic lineages and the family of the Prophet Mohammad. The former Somali state was officially Islamic; the overwhelming majority of Somali nationals are Sunni Muslims. Less than one percent are Christian. By the early 1990's the Salafist brand of fundamental Islam had made inroads into Somali culture. An Islamist militant group known as al-Itihaad al-Islamiya sought to create an Islamic state in the Horn of Africa and was partially funded by the al-Qaeda terrorist organization.

(e) **Clan Structure.** The history of the Somali people is inevitably tied to the various tribes, or clans, and their subclans (see Figure B-7). Although Somalis are homogeneous and tied to common ancestors that migrated from the Ethiopian highlands thousands of years ago, they had been influenced by the trading communities of the Indian Ocean, especially the Persians, Omanis, and Yemenis. Although the nomadic clans, such as the Darood in central and southern Somalia, tend to be more broadly dispersed, most clan groups have fairly well-defined geographical boundaries: The Hawiye are located in the Mogadishu area; the Isaaq in the north, the Dir in the northwest; and the Digil and Rahanwayn in the river areas of the south. The nomadic clan families: the Dir, Isaaq, Hawiye and Darood, believe they are the "true Somali," and therefore have a higher status in Somali society. The southern riverine agrarian groups only achieved a measure of political equality under Barre.

(f) **Government and Politics.** In 1991, Somalia was nominally under an interim provisional government established by the Executive Committee of the USC and headed by the provisional president: Ali Mahdi Mahammad. In reality, factional infighting placed large segments of the country effectively under the control of as many as 30 rival clans and subclans.

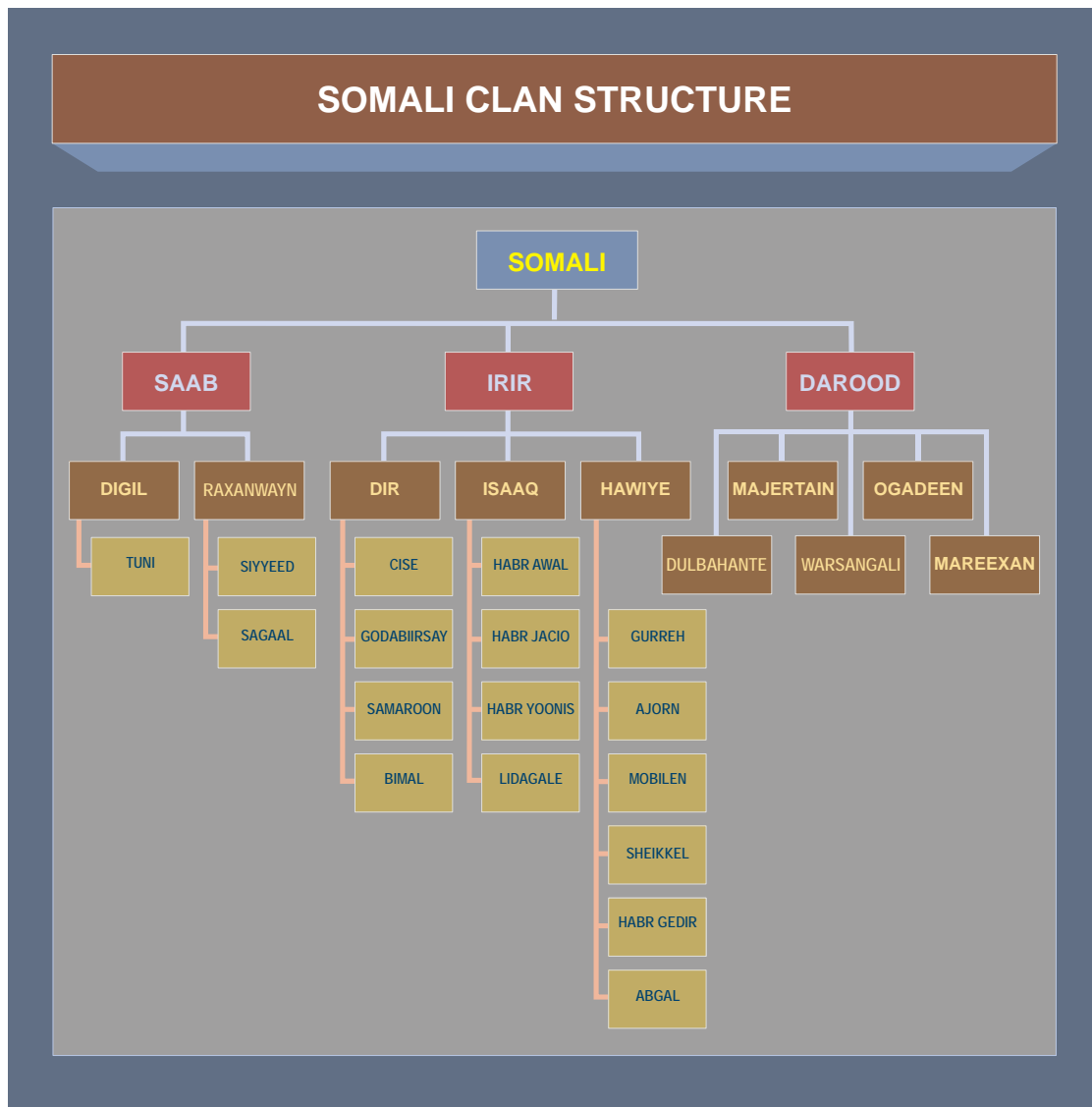


Figure B-7. Somali Clan Structure

(7) **Systems Network Analysis.** Based on an analysis of the sociocultural factors discussed above, analysts may visually depict normal relationships among various elements (links and nodes) within the Mogadishu environment. Some of these connections involved the various clans and factions with local gangs, locally hired guards, critical logistics and information environment nodes, Islamic jihadist elements, and IGOs and NGOs. This baseline analysis depicts the normal interactions among multiple system nodes. For illustrative purposes, a simplified version of a consolidated systems overlay is depicted at Figure B-8.

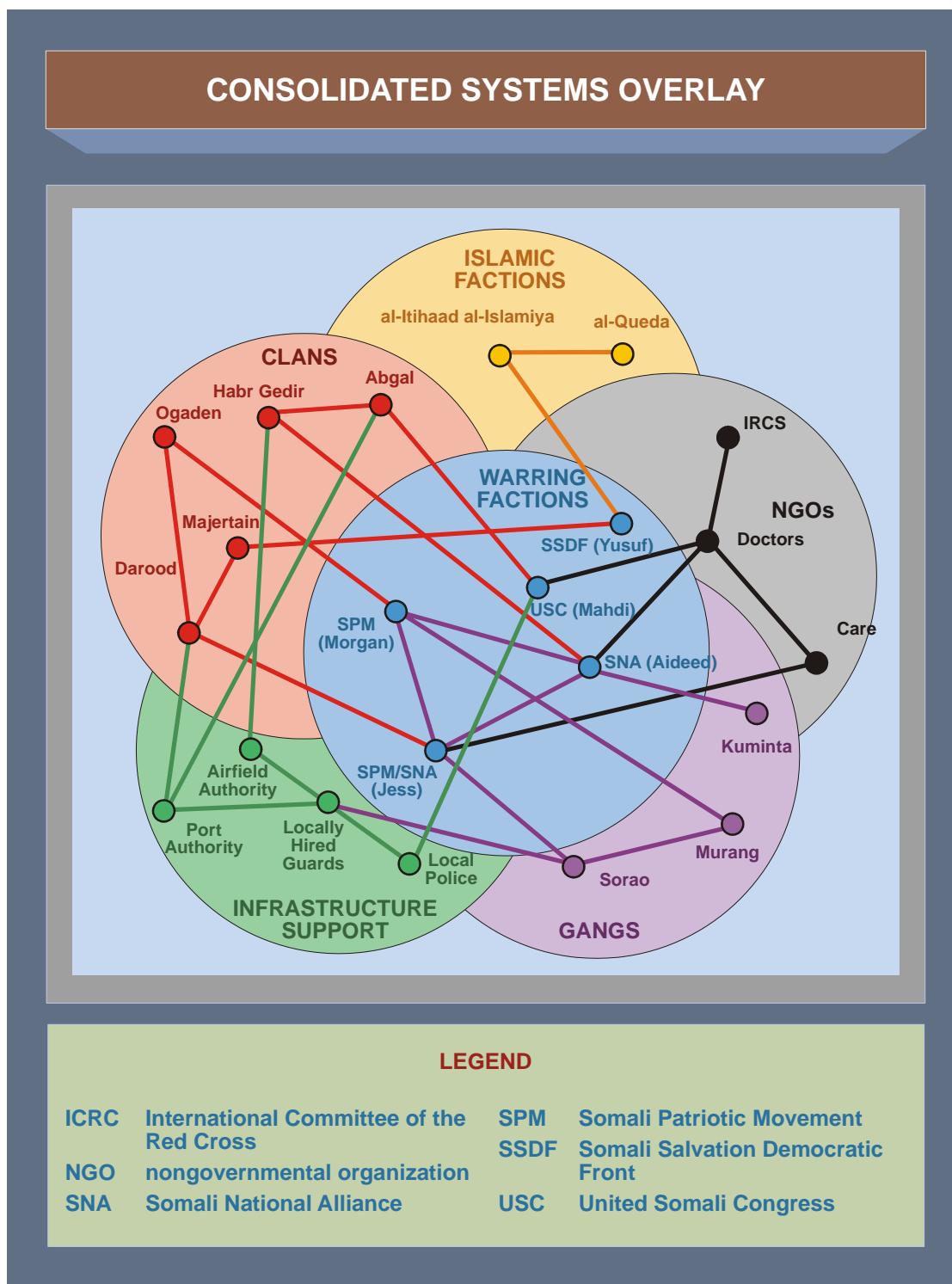


Figure B-8. Consolidated Systems Overlay

#### c. Evaluate the Adversary

(1) **Warring Factions.** Overlaying the clan structure of Somalia in 1991 was a complicated set of shifting alliances among various warring factions. These warring

factions, led in most cases by powerful warlords with well-armed militias, were geographically based (see Figure B-9). Prior to fall of Siad Barre regime in January 1991, there were 84 districts organized into sixteen administrative regions and the capital. Each region had three to six districts, with exception of the capital, which was subdivided into fifteen districts. There was **no effective government after the fall of Barre**. Tribal clans dominated by local warlords occupied the former districts. The central government

SOMALI WARRING FACTIONS					
FACTION	LEADERSHIP	NUMBERS	WEAPONS	LOCATION	DOMINANT CLAN
USC/SNA United Somali Congress/ Somali National Alliance	Mohammad Farrah Hassan AIDEED  Oman Hassan Ali ATTO	5,000 – 10,000	Armored vehicles, Recoilless rifles, Artillery, Mortars	Central Somalia including South Mogadishu	Habr Gedir
USC (Mahdi) United Somali Congress – Mahdi	Ali MAHDI Mohammad	Approx 8,000	Small arms and technicals	Central Somalia to the north of Mogadishu	Abgal
SPM/SNA Somali Patriotic Movement/ Somali National Alliance	Ahmed OMAR JESS	Approx 2,000	Small arms and technicals	Southern Somalia  Kismaayo/ Jilib	Darood
SSDF Somali Salvation Democratic Front	Abdullahi YUSUF  Mohammad ABSHIR Musse	2,000 – 5,000	Armored vehicles, Artillery, Technicals	North Central Somalia between USC and SNF areas	Majertain
SPM (Gabio) Somali Patriotic Movement	Mohammad Siad Hersi MORGAN	Unknown	Small arms and technicals	Southern Somalia Kismaayo	Ogaden
SNF Somali National Front	Ahmed Warsame Mohammad HASHI	2,000	Heavy weapons, Artillery, Mortars	Northwestern Somalia	Isaaq

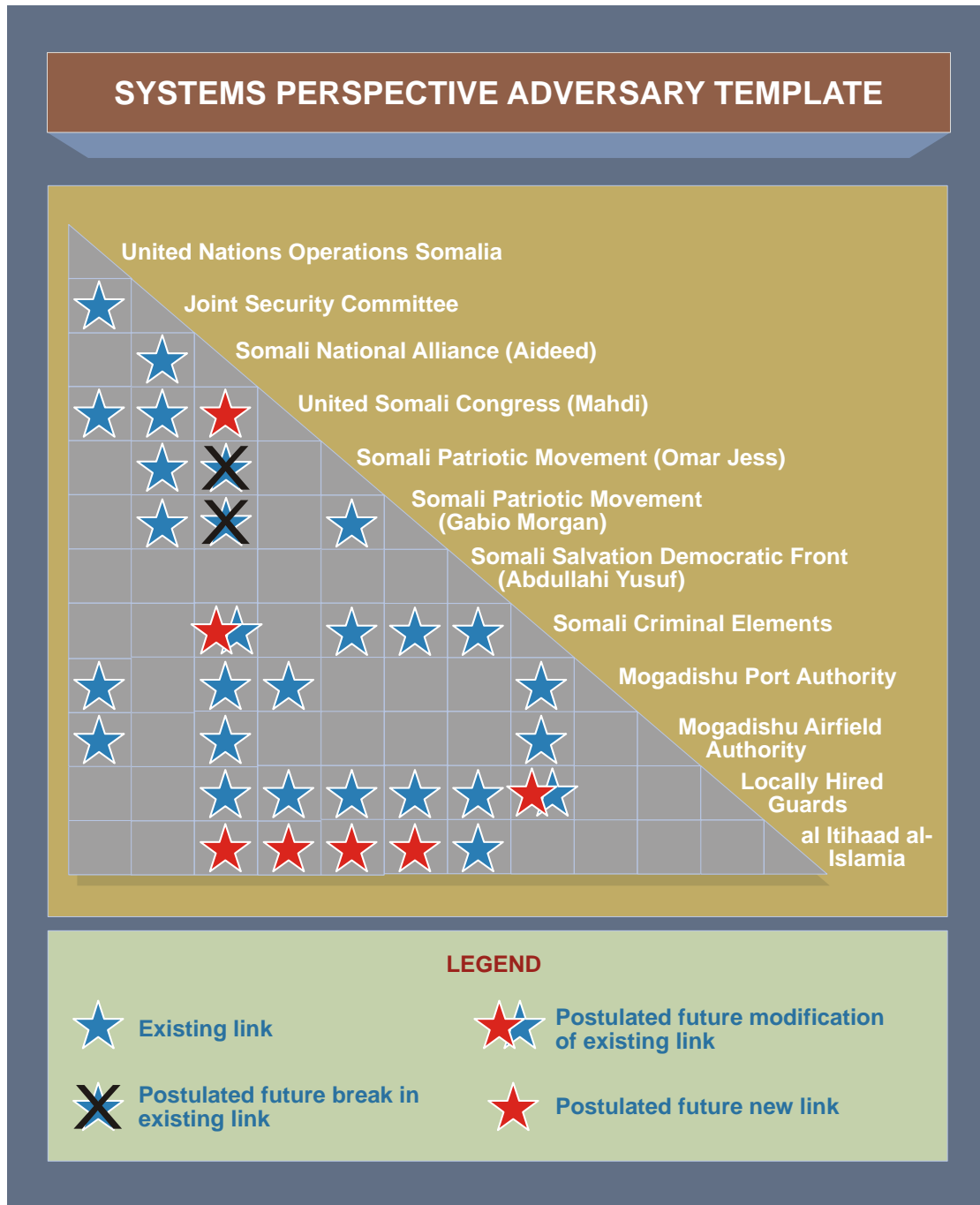
Figure B-9. Somali Warring Factions



authority at Mogadishu was immediately challenged by the Somali National Front (SNF), which in June 1991 declared the independent Republic of Somaliland in the former territory of British Somaliland in northern Somalia. The constitution of 1979 was nominally in force pending a new constitution proposed by the provisional government. A constitutionally mandated national legislature known as People's Assembly was inactive since January 1991. In Mogadishu, the USC faction led by Aideed contested the authority of the USC Executive Committee to form an interim government and establish a rival government in southern Mogadishu. This action forced Ali Mahdi's government to retreat to northern Mogadishu. Backed by overwhelming US and UN power, Ambassador Oakley effectively established a cease-fire between the warring factions. Under this arrangement, Aideed and Ali Mahdi also agreed to canton their heavy weapons and technicals in authorized weapons storage sites that were periodically inspected by UNITAF.

(2) **Perceptions Toward UN Relief Operations.** There were varying degrees of hostility towards the UN and international relief operations across the country depending on the warring faction occupying the area and its leadership. Ali Mahdi and his USC was unpredictable but generally supportive of the UN relief efforts. In the north, the SNF had withdrawn from the government in Mogadishu and had no objection to relief operations in its area as long as the UN didn't threaten its independence movement. The Somali Salvation Democratic Front, in the area of Somalia sandwiched between Ali Mahdi's USC territory and the SNF, were generally pro-UN but also had links to al-Itihaad al-Islamiya. The antagonist factions were located in the region from south Mogadishu to the port city of Kismaayo and as far west as Baidoa and Bardera. The primary protagonist was the SNA faction of the USC led by Mohammed Farrah Hasan Aideed and Omar Hassan Ali Atto. Aideed and Atto disapproved of any outside intervention in Somalia. Aideed was a former General in the Barre government with considerable influence in the powerful Habr Gedir clan who had broken with the nominal government formed by Ali Mahdi. Aideed was gaining wealth and power from the country's ongoing chaos and saw intervening UN forces as a threat to his power base, maintained by threat and intimidation and the ability to withhold food. Aideed's allies, the SNA/Somali Patriotic Movement (SPM) led by Omar Jess and the SPM-Gabio led by Mohammad Siad Hersi Morgan, occupied the territory to the south of the capital. This was a primary issue for the UN relief effort, as they occupied the main transportation hubs in southern Somalia, and therefore, had to be dealt with.

(3) **Adversary Models.** A systems perspective adversary template is developed using a modified association matrix format that depicts postulated future new links, or modifications to existing links, that would be indicative of specific COAs. These postulated links are based on knowledge of past adversary practices or logical assumptions regarding what the adversary may be expected to do in certain situations. For example, a resumption of fighting among the warring factions might be indicated by a breakdown of the existing "alliances" between Aideed, Morgan, and Jess as depicted in Figure B-10. Likewise, an Islamic jihad might be indicated by attempts by al-Itihaad al-Islamiya to establish new relationships with the USC, SPM, and SNA.



**Figure B-10. Systems Perspective Adversary Template**

(4) **Adversary Situation.** Mogadishu was considered a key hub in the transportation network for relief supplies into Somalia. Most of the relief supplies for central and southern Somalia, the areas hardest hit by civil strife and famine, pass through Mogadishu and its seaport and airport. Mogadishu was also the location of the main fault line between warring factions represented by the SNA (Aideed) on the one side, and the USC (Ali Mahdi) on the other. Therefore, the situation in Mogadishu for UN humanitarian relief was critical to the overall operation. Consequently, a detailed

analysis of the Mogadishu area, including overlays for regional Mogadishu were created as shown in Figures B-11 through B-16.

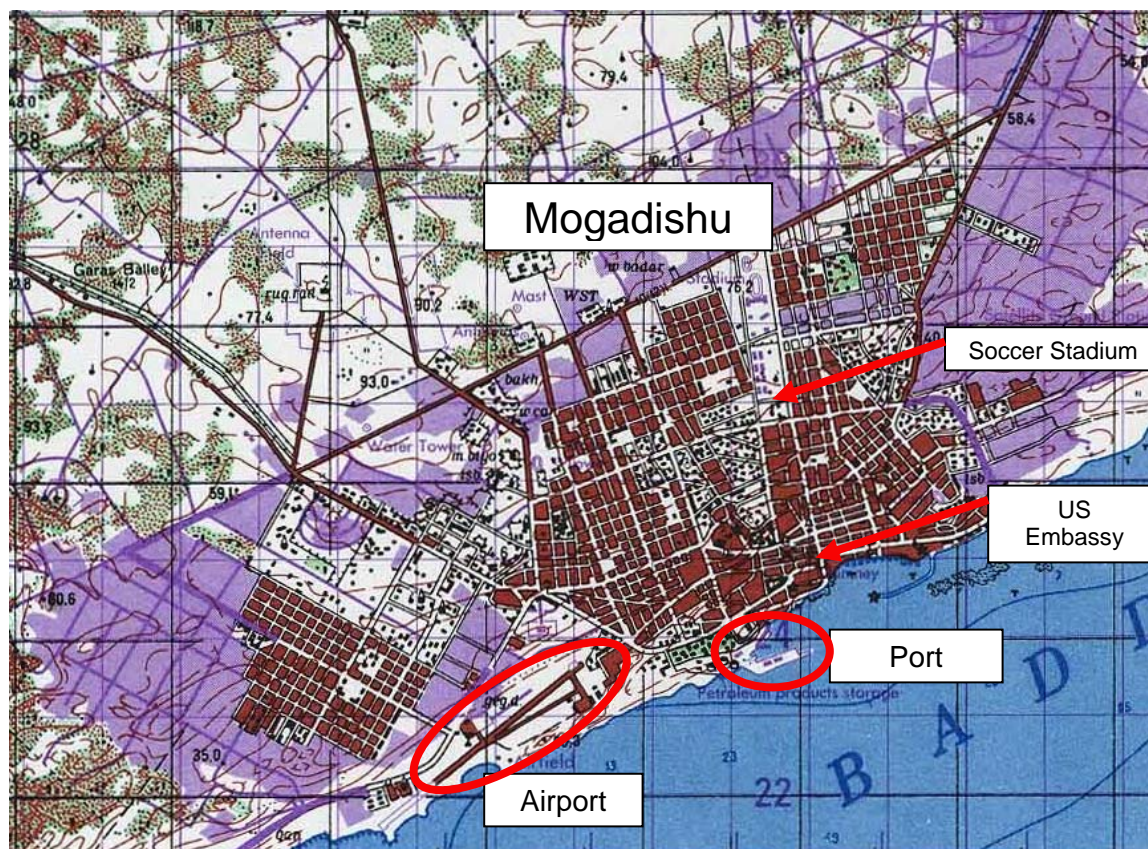


Figure B-11. Map of Mogadishu

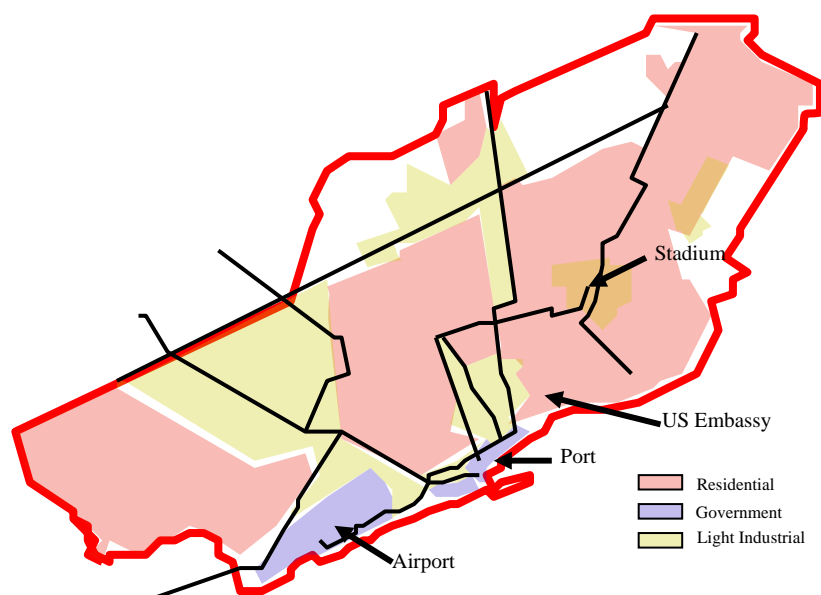
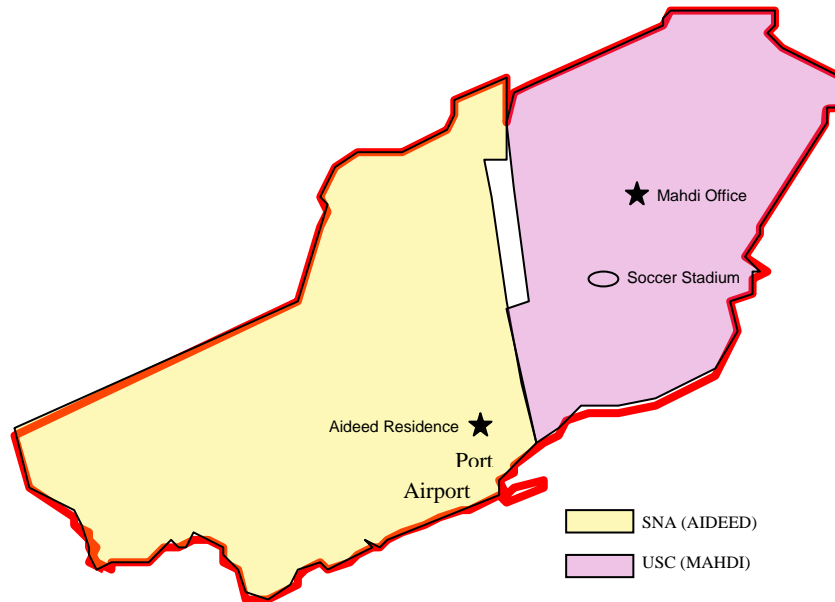
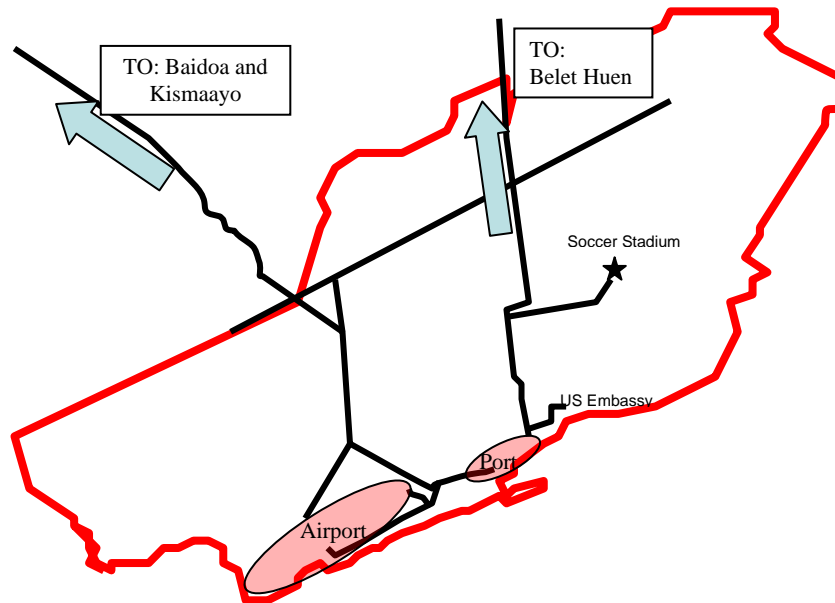


Figure B-12. Mogadishu Land Use Overlay



**Figure B-13. Mogadishu Faction Control Overlay**



**Figure B-14. Mogadishu Transportation Overlay**

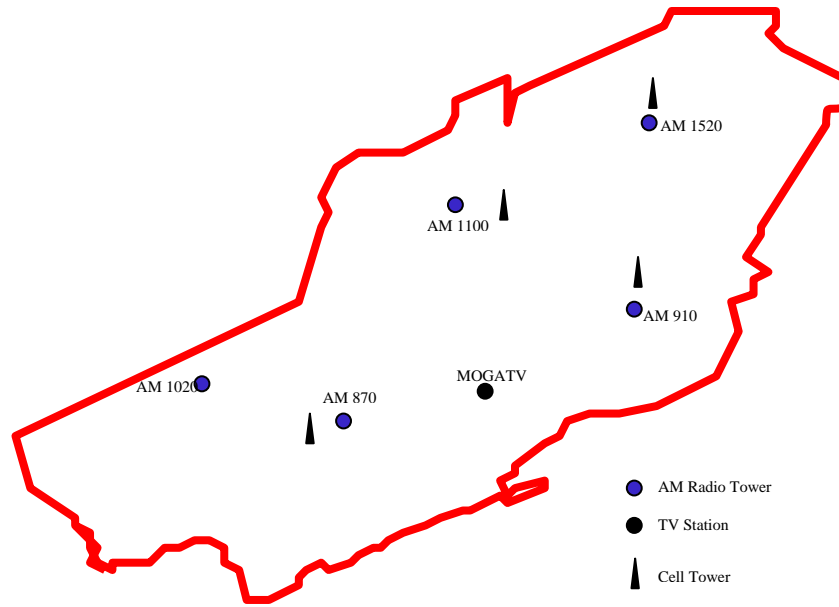


Figure B-15. Mogadishu Information Environment Overlay

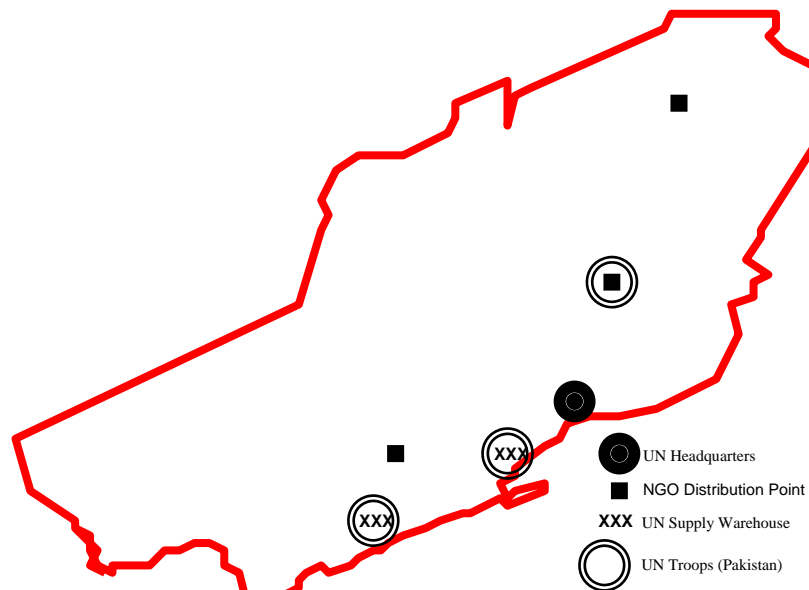


Figure B-16. Mogadishu International Presence Overlay

(5) **Center of Gravity Analysis.** In order to perform a detailed COA analysis on the potential for warring factions to become involved in opposition to coalition famine-relief operations, JTF RESTORE HOPE personnel initially attempted to determine the COG for each of the warring factions involved in the ongoing strife. The objective of the COG analysis was to gauge for the JTF leadership the potential for negotiated settlement which could lead to improved stability in Somalia. JTF intelligence analysts relied upon information from both traditional intelligence channels and external sources to perform COG analysis. Much of the most pertinent data was acquired from



Ambassador Oakley, who had conducted personal negotiations with the leaders of various warring factions in the period preceding Operation RESTORE HOPE, and had access to detailed and current information on the prominence and attitudes of faction leaders. Other information came from NGOs represented in the UN Humanitarian Operations Center and RESTORE HOPE Civil-Military Operations Center (CMOC) engaged in the relief operation on the ground. NGO personnel operated daily in the Somalia environment and had frequent contact with local officials, many with ties to factions and associated militia. Contact with NGO personnel occurred frequently through interactions with the CMOC. Although unable to levy collection requirements on NGO personnel, the CMOC obtained valuable information through routine information exchanges in the normal course of conducting NGO support coordination. Finally, some coalition partner members engaged in Operation RESTORE HOPE had a unique understanding of the historical background of the Somali nation and the current political situation in Somalia developed over time through a long history of dealing with the local populace. This multinational analytic effort with other coalition members enabled the JTF J-2 to estimate the most likely perceived COGs for individual faction leaders as shown in Figure B-17.

CENTER OF GRAVITY ANALYSIS		
Faction Name	Leadership	Center of Gravity
USC/SNA (United Somali Congress/ Somali National Alliance)	Mohammad Farrah Hassan AIDEED  Oman Hassan Ali Atto	<ul style="list-style-type: none"> <li>Control of Habr Gedir Clan (One of the strongest and most prominent clans in Somalia)</li> <li>Reputation as a capable Somali general</li> <li>Access to weapons/resources to maintain clan loyalty</li> </ul>
USC (Mahdi) United Somali Congress - Mahdi	Ali MAHDI Mohammad	<ul style="list-style-type: none"> <li>International Legitimacy</li> <li>Relationships with UN/NGOs for relief supplies</li> <li>Access to food/resources for patronage</li> </ul>
SPM/SNA Somali Patriotic Movement/ Somali National Alliance	Ahmed OMAR JESS	<ul style="list-style-type: none"> <li>Association with Darood Clan</li> <li>Reputation as a military leader</li> <li>Geographical base and access to Port of Kismaayo resources</li> <li>Alliance with Aideed</li> </ul>
SSDF Somali Salvation Democratic Front	Abdullahi YUSUF  Mohammad ABSHIR Musse	<ul style="list-style-type: none"> <li>Clan base (Majertain)</li> <li>Large militia and weapons</li> <li>Geographical center</li> <li>Food/Money generated from protection of UN/NGOs</li> </ul>

SPM (Gabio) Somali Patriotic Movement	Mohammad Siad Hersi MORGAN	<ul style="list-style-type: none"> <li>• Clan base (Ogaden)</li> <li>• Reputation as a Somali General</li> <li>• Geographic region (Kismaayo)</li> <li>• Alliance with Aided</li> </ul>
SNF Somali National Front	Ahmed Warsame Mohammad HASHI	<ul style="list-style-type: none"> <li>• Clan base (Isaaq)</li> <li>• Isolated geographic region (Northwest Somalia)</li> </ul>

**Figure B-17. Center Of Gravity Analysis**

**d. Determine Adversary Courses of Action**

(1) **Potential Courses of Action.** Having accomplished the COG analysis as depicted in Figure B-17, JTF J-2 personnel conducted a strategic analysis of potential adversary COAs as depicted in Figure B-18. The JTF did not view the terrain or climate of Somalia to be prohibitive to accomplishing the mission, owing to the extensive experience gained by US and Allied forces during exercises and operations conducted in the southwestern US and Middle East, respectively. However, JTF J-2—personnel determined that the social/political climate in Somalia was fractured and that well-armed groups within the Somali society could potentially cause friction. Additionally, the JTF RESTORE HOPE J-2 anticipated that the nascent Islamic Jihadist movement in Somalia could oppose the US/UN presence. Although considered small in numbers, the Jihadist movement in Somalia had a large population of disaffected young, unemployed Somalis from which they could recruit and radicalize in opposition to Western IGOs.

<b>ADVERSARY POTENTIAL COURSES OF ACTION</b>				
	<b>COA-1</b> Militia Factions Acquiesce	<b>COA-2</b> Some Militia Factions Oppose	<b>COA-3</b> Widespread Civil War Erupts	<b>COA-4</b> International Islamic Jihadists intervene
Implication	Least Dangerous COA for US/UN	US/UN forces must increase peace enforcement activities. Violence, Casualties increase.	Mission devolves into peace enforcement. NGO organizations withdraw. UN/US efforts directed towards separating warring factions.	Increased force protection measures draws resources away from aid distribution. Violence, Casualties increase.
Adversary Objective	Maintain control of Factions/clans/militias.	Continuing unstable	Gain the most	Terrorist organization



	Wait out international Community.	humanitarian situation benefits one or more factions. Wealth, political power increased.	wealth/power from instability. Emerge the dominant faction in Somalia.	forces US/UN withdrawal garnering a propaganda coup. Possibility of establishing an Islamic state.
Threat to US/UN mission	Passive resistance to UN aid distribution. Low level banditry/corruption increases time and cost of operation.	Localized small-scale engagements directed at US/UN troops and UN aid workers to influence a rapid departure from Somalia	Expanded peace enforcement mission results in heightened casualties and prompts UN member nations to withdraw support.	Bombings, assassinations increase civilian and military casualties. Some NGOs depart. May prompt reevaluation of mission by UN member nations.
Probability / Consequence	Low / Low	High / Medium	Medium / High	Medium / High

Figure B-18. Adversary Potential Courses of Action

**(2) Course of Action Development.** Each COA is developed in as much detail as time permits. As an aid to detecting which potential COA one or more factions may take, analysts formulate indicators they would expect to encounter that would objectively point to one COA or another. This analysis may be depicted in situation templates (geospatial and/or systems) for each potential COA. For illustrative purposes, the analysis of each COA is depicted in the following series of systems situation templates (see Figures B-19 through B-22), which show the postulated future link changes that would indicate each COA's possible adoption by the adversary.

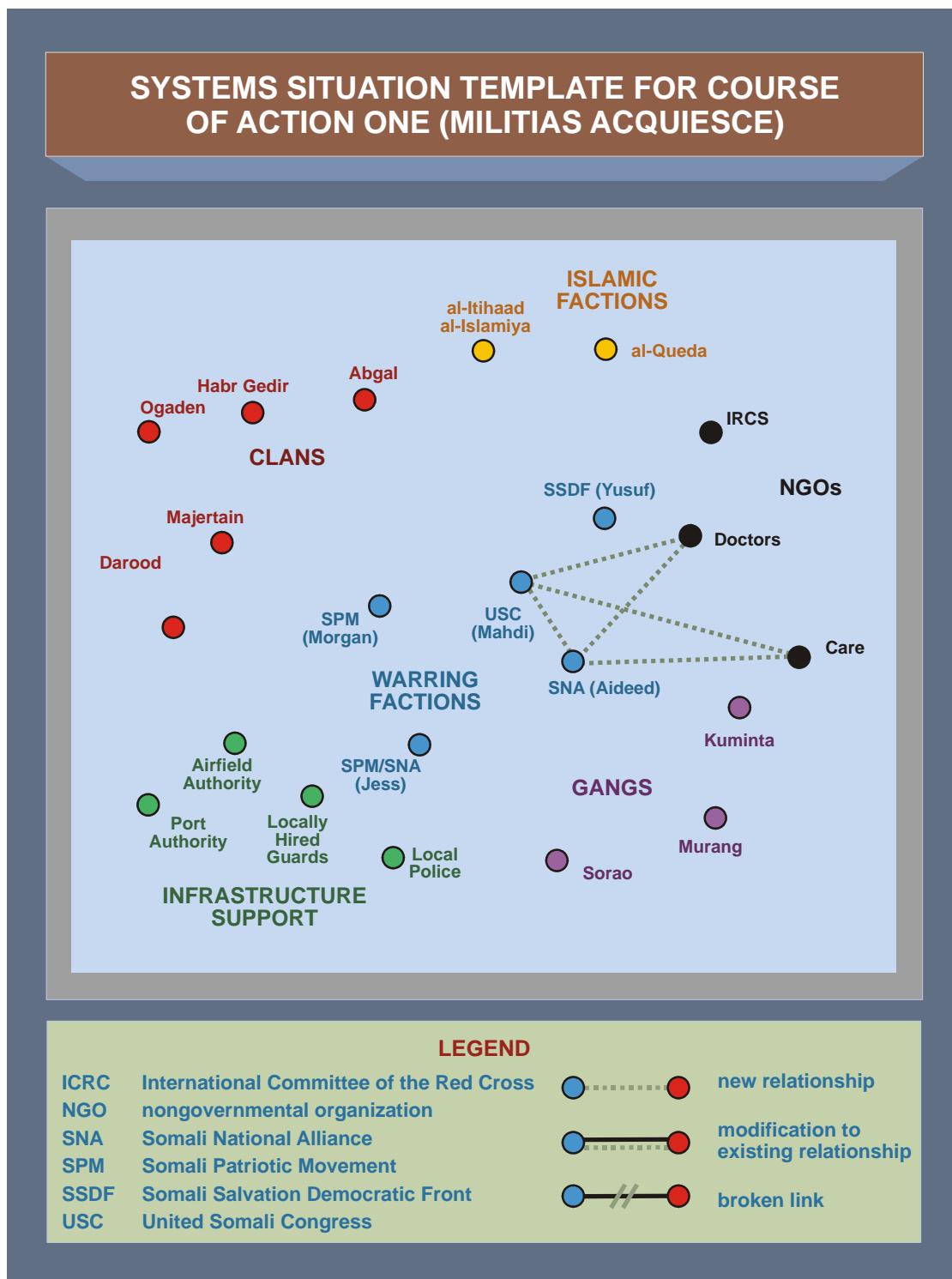


Figure B-19. Systems Situation Template for Course of Action One – Militias Acquiesce

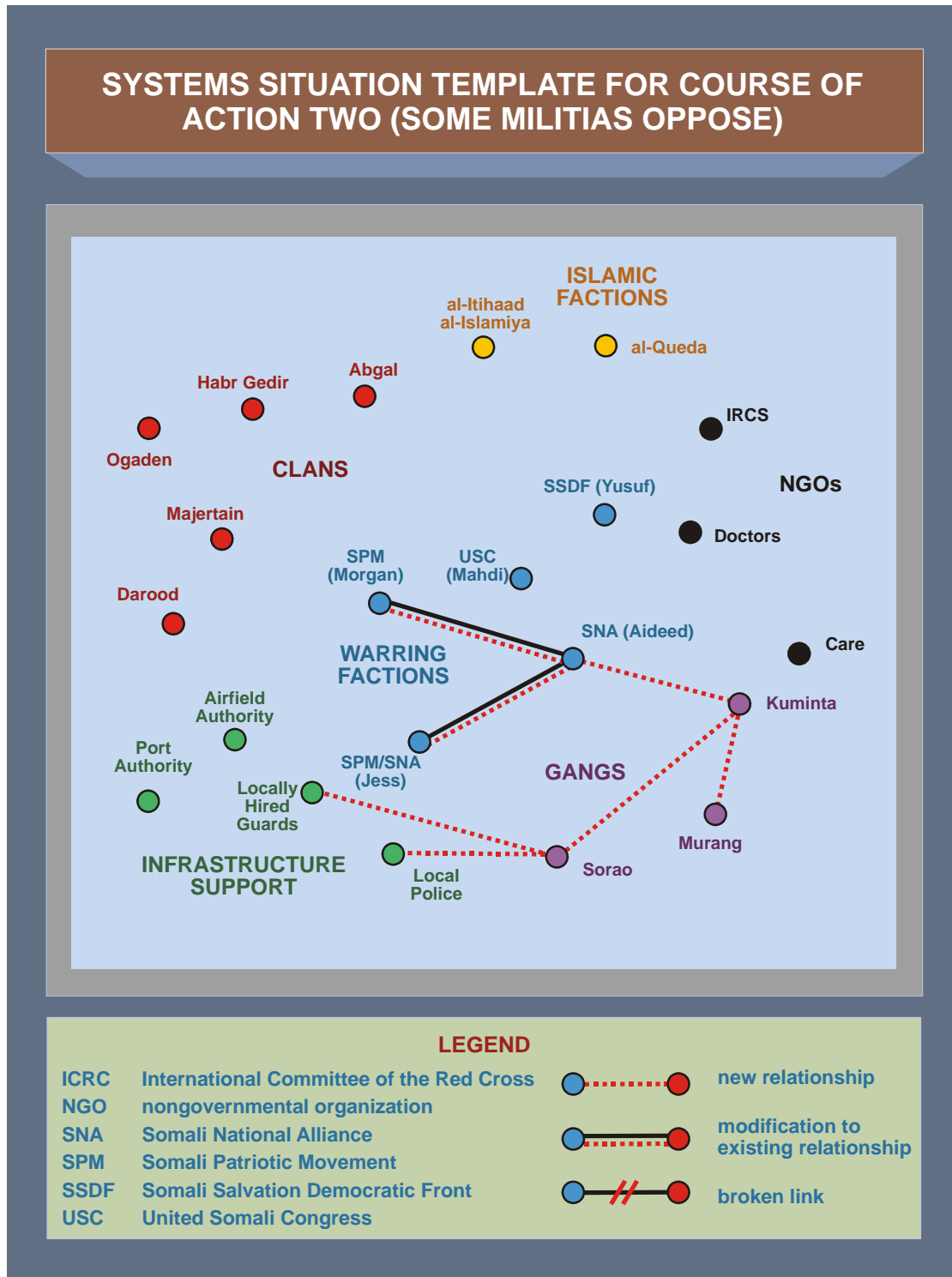


Figure B-20. Systems Situation Template for Course of Action Two – Some Militias Oppose

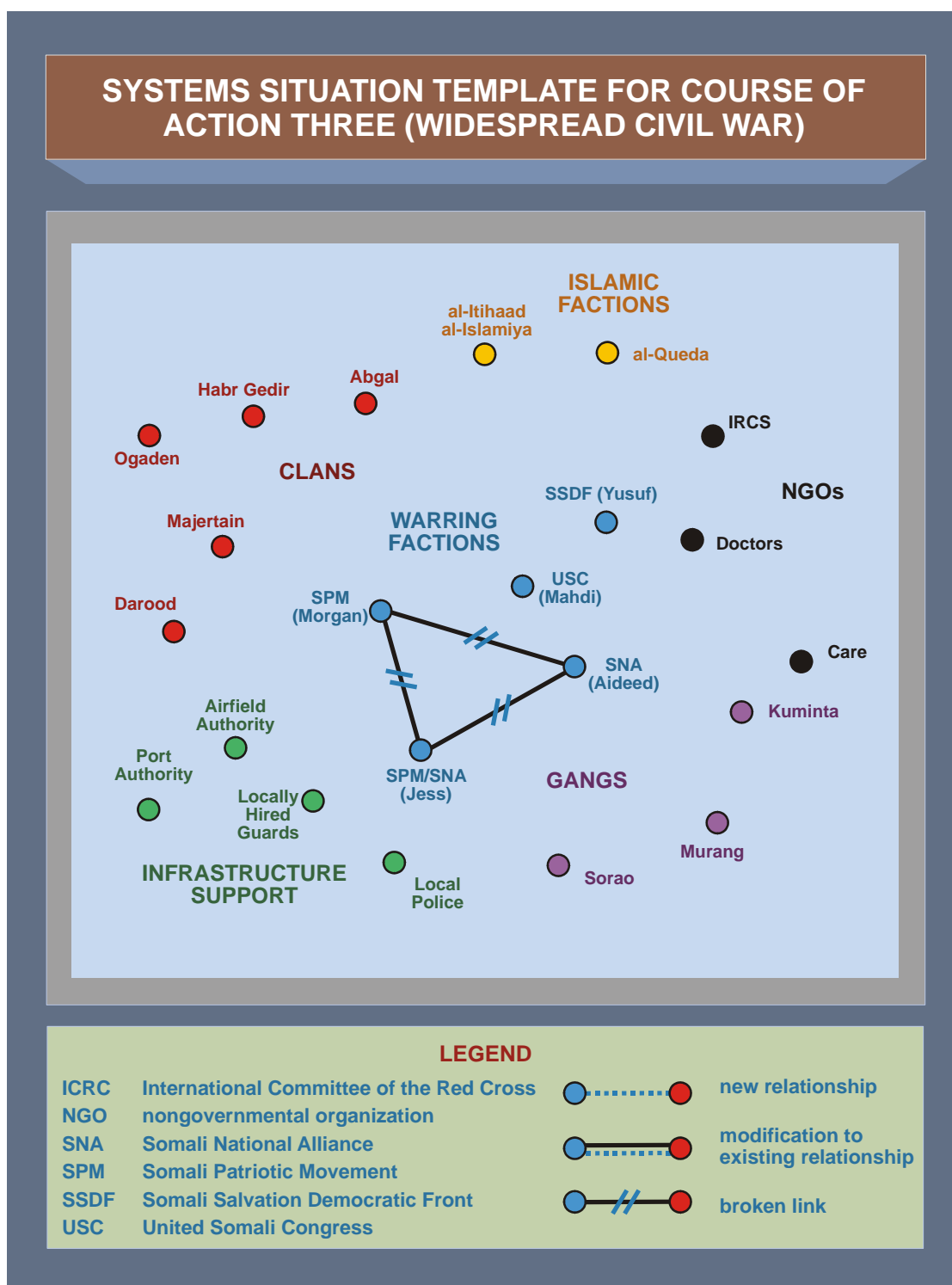


Figure B-21. Systems Situation Template for Course of Action Three – Widespread Civil War

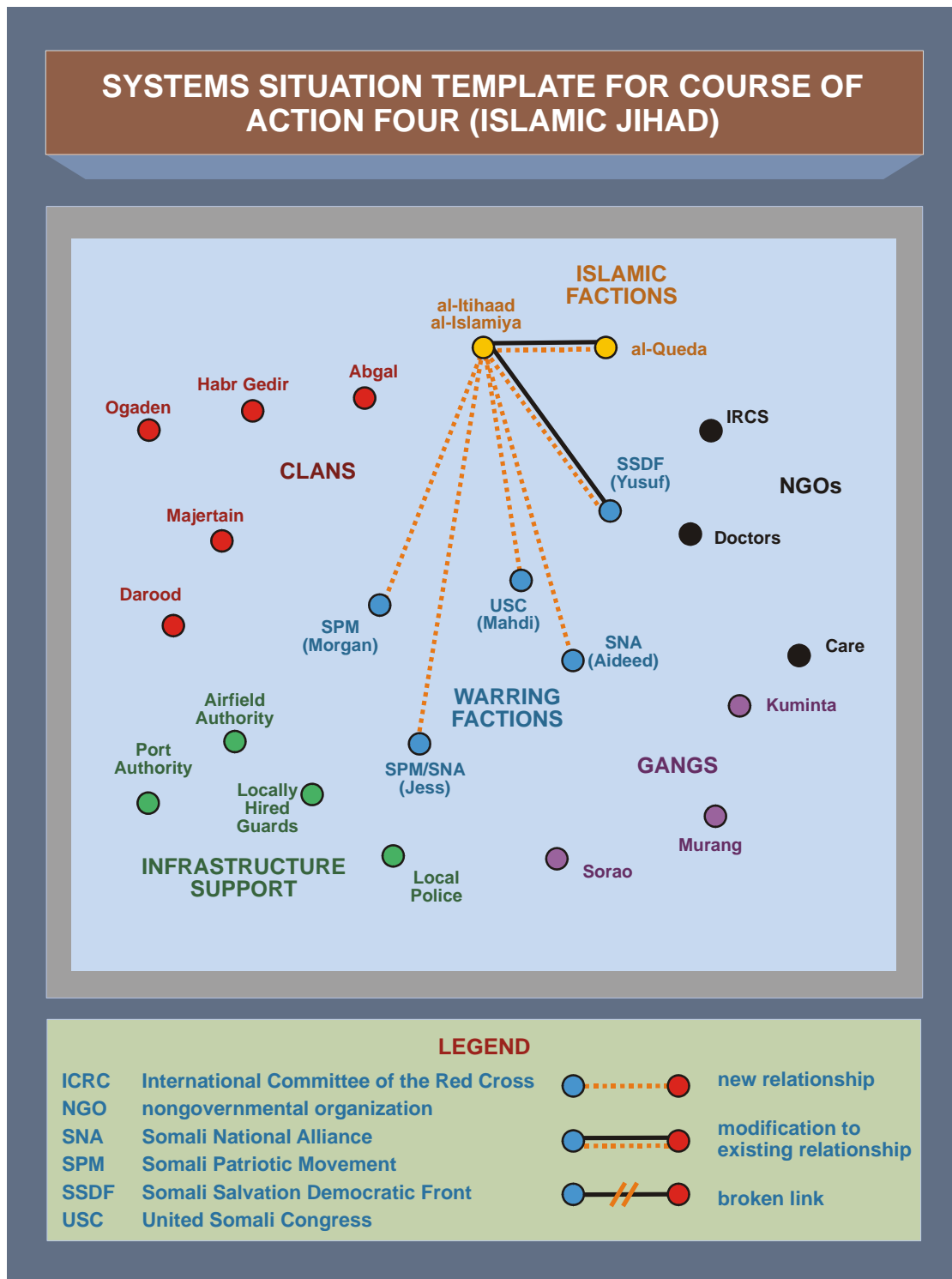


Figure B-22. Systems Situation Template for Course of Action Four – Islamic Jihad

(3) **Identification of Collection Requirements.** An event template (either geospatial or systems) is developed by comparing the analyses depicted on the situation templates for each adversary COA. The purpose of this comparison is to identify those NAI that are unique to the adoption of a specific COA and that may form the basis for

collection requirements. For illustrative purposes, a systems event template is depicted in Figure B-23 to illustrate the consolidation of the four systems situation templates indicated above. Each postulated future link may be designated as a NAI and is summarized in the event matrix depicted in Figure B-24.

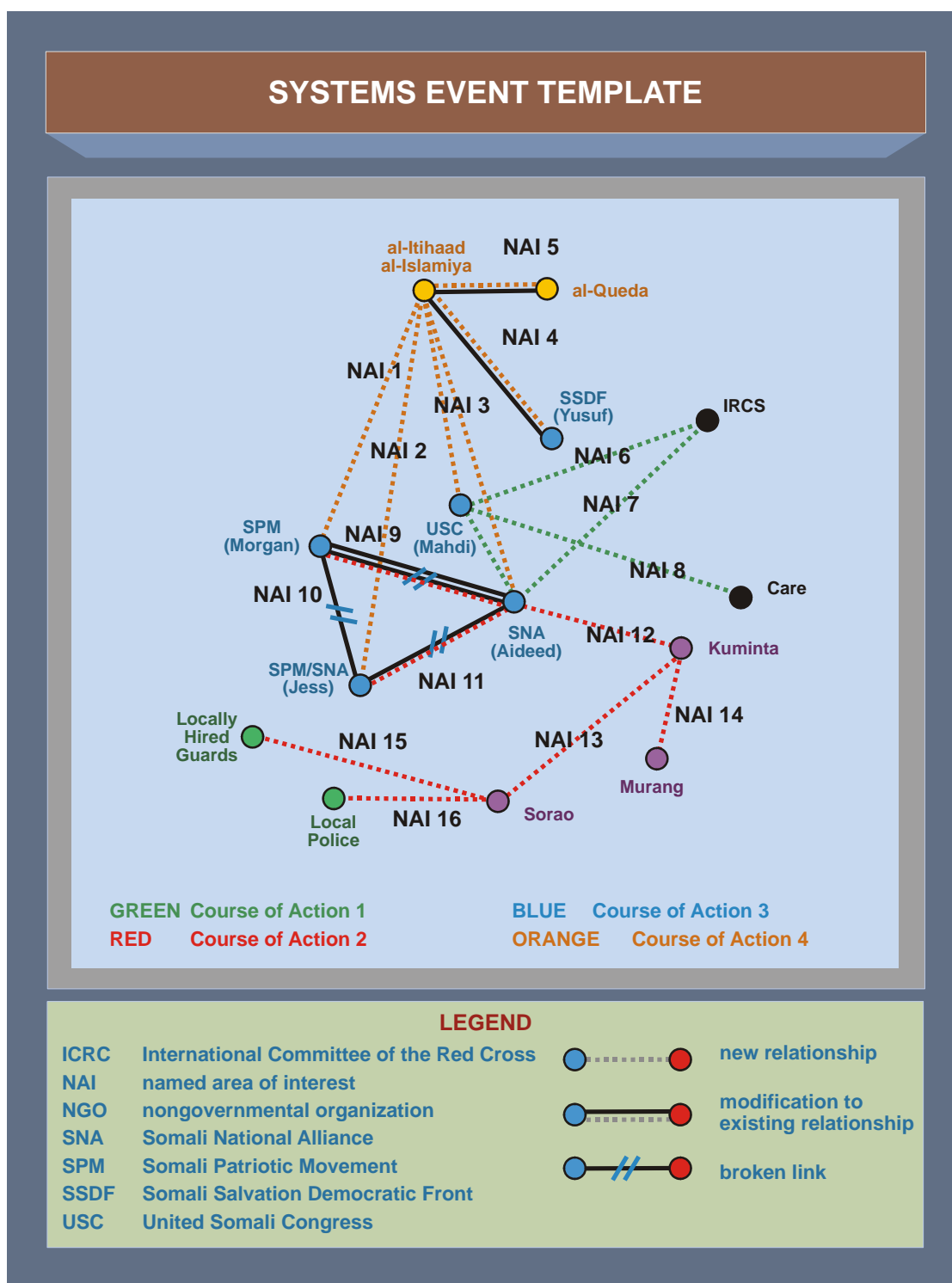


Figure B-23. Systems Event Template

EVENT MATRIX				
	COA 1	COA 2	COA 3	COA 4
Increased contact with UN/NGOs	++		—	—
Decreased participation in UN Forums	—	++	+	
Forming new alliances within and among militia factions		+	+	
Increased influence over local police and locally hired guard forces		+		
Increased influence over airfield/port authority workforce		++	+	
Increased ties and evidence of collaboration with criminal gangs	—	+	++	+

LEGEND	
COA	course of action
NGO	nongovernmental organization
UN	United Nations

Figure B-24. Event Matrix

### 3. Aided Chooses to Challenge UN Forces

a. **Mission Shift.** Despite some setbacks and incidents, Operation RESTORE HOPE succeeded in its goal of bringing an end to mass starvation. The heavily armed UNITAF units quickly established security in their sectors, and an uneasy truce kept the peace between the factions. By April 1993 the situation had stabilized enough that the US administration determined that it was time to turn the mission over to the UN entirely. On 4 May 1993, operations in Somalia transitioned from the US-led UNITAF to UNOSOM II, which was hindered by a much reduced force structure and an expanded mission. Whereas UNOSOM I (Operation RESTORE HOPE) focused on foreign humanitarian assistance and reducing violence, the mission of UNOSOM II (Operation



CONTINUE HOPE) was expanded to include nation building and set the stage for direct confrontation with the warring factions.

b. **Indications of Aideed's Decision to Confront UNOSOM II.** For several months prior to the turnover of command from UNITAF to UNOSOM II, intelligence analysts detected indications that Aideed's militia would militarily challenge the weakened UN forces.

(1) **Systems Network Analysis.** In the first half of 1993, JTF analysts detected changes in the normal interactions among system nodes as depicted below in Figure B-25. Among the primary factions existent in southern Somalia, information from numerous sources indicated increased contact between Aideed's SNA faction and the two dominant political/military factions in the Kismaayo/Jilib area south of Mogadishu. At the same time, indications were received that Aideed had formed a new alliance with criminal elements in Mogadishu and requested they infiltrate local police and locally hired guards operating at the port of Mogadishu and Mogadishu airport. These deviations from the norm represented initial indications of a change in normalcy by the SNA, one of the primary actors, of a decision to pursue COA-2 (active conflict with UN forces).

(2) **Additional Indications of COA-2.** During the first three weeks of April 1993, Aideed traveled extensively to Sudan, Yemen, Uganda, and Kenya reportedly to garner personal political support, arms, and money. He also spent time in central Somalia gathering up new fighters and previously stockpiled weapons that had been sent out of Mogadishu during the UNITAF occupation. Starting in May, Radio Mogadishu, controlled by Aideed, began an anti-UNOSOM II hate campaign that lambasted UN and US forces as aggressors intent on colonizing Somalia and called on Somalis to resist foreign domination. Concurrent with this increase in propaganda came reports from HUMINT and imagery intelligence sources that Aideed's authorized weapons storage sites in Mogadishu were becoming active. Most ominous, during the night of 6-7 May 1993, a UNOSOM II Belgian unit in Kismayo came under coordinated attack by SPM/SNA militia controlled by Omar Jess, an Aideed ally.

c. **Open Conflict.** Reports that weapons and technicals at Aideed's authorized weapons storage sites had been moved by the end of May caused considerable concern within UNOSOM II. In reaction, UNOSOM II forces declared their intention to conduct a concurrent inspection of all the storage sites of both Aideed and Ali Mahdi on 5 June 1993. A Pakistani brigade was assigned the task of inspecting Aideed's five sites, two of which were collocated with the Radio Mogadishu facility. Although Aideed's guards at each site cooperated with the UN inspectors, hostile crowds began to form around the radio station. As the Pakistani forces concluded the inspections and began to redeploy to their barracks they came under automatic weapons and antitank fire from Aideed's militia. By using a series of well planned ambushes throughout the day, coupled with the use of women and children as shields, the militia killed 24 Pakistanis and wounded over 75 other UN soldiers. This attack began an all out struggle between UNOSOM II and Aideed that culminated in the "Black Hawk Down" incident and the ultimate withdrawal of US forces from Somalia.

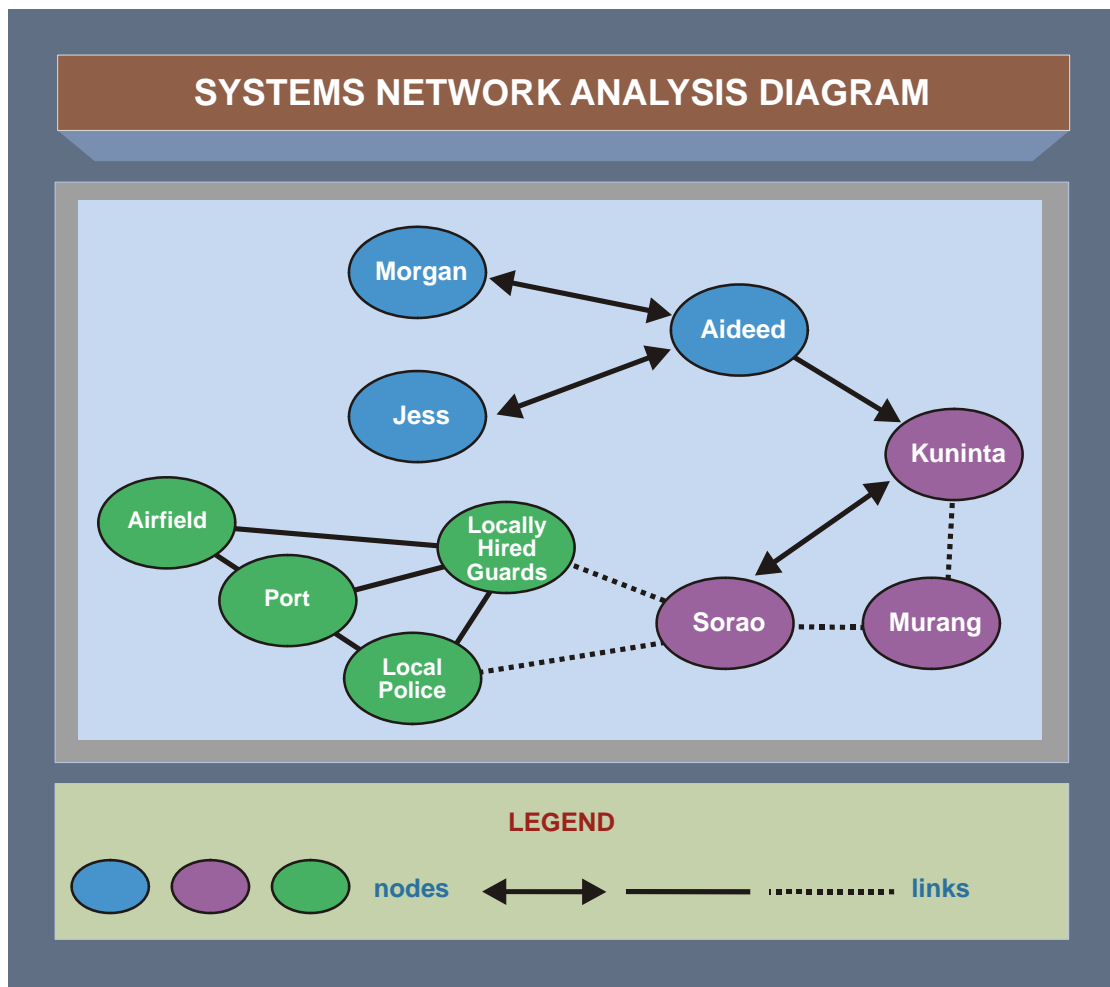


Figure B-25. Systems Network Analysis Diagram

#### 4. Lessons Learned

The result of this effort not only characterized the operating environment in Somalia at the time, but incorporated information from a wide variety of sources to determine the most probable COA by existing militia factions. Throughout Operation RESTORE HOPE this information enabled UNITAF to maintain the peace by successfully anticipating potentially hostile adversary actions. Although UNOSOM II expressed surprise at the intensity of the 5 June 1993 attacks, UN forces had ample warning of Aideed's intent to test the military resolve of Operation CONTINUE HOPE. Additionally, the analytic effort may have suffered as a result of the relatively inefficient transfer of responsibilities from UNITAF to UNOSOM II. It should be remembered that the JIPOE process is continuous and requires constant reassessment as the mission and conditions on the ground change.

## 5. Sources

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- b. Hirsh, John L., and Oakley, Robert B. *Somalia and Operation Restore Hope: Reflections on Peacemaking and Peacekeeping*. Washington, D.C.: United States Institute of Peace Press, 1995.
- c. *Resource Guide Unified Task Force Somalia, December 1992-May 1993, Operation Restore Hope*. Washington, D.C.: US Army Center of Military History, 1994.
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## APPENDIX C

### ANALYZING AND DEPICTING A SYSTEM

*“Any attempt to reform the university without attending to the system of which it is an integral part is like trying to do urban renewal in New York City from the twelfth story up.”*

Ivan Illich (1926 - 2002) Austrian-born US writer

This appendix contains two sections to help analysts think about how to analyze and depict systems in the operational environment. **Section A** discusses one alternative for how JIPOE analysts can provide a systems “visualization” to support a JFC’s counterdrug operations in a hypothetical narcotics scenario. **Section B** contains six charts that list typical PMESII subsystems.

#### SECTION A. VISUALIZING SYSTEM RELATIONSHIPS

##### 1. Overview

When the US conducts combat operations, the impact of those operations is rarely confined to a single country. In many cases, there are implications that cross regional PMESII systems and subsystems, and could have global impact as well. Likewise in operations such as counterdrug, combating terrorism, and counterinsurgency, the adversary typically will act in ways and within networks that cross nation-state borders. In fact, these networks can have a significant influence on the traditional, established nation-state and regional systems. For example, a terrorist network can commit terrorist acts in three countries, have a safe haven and base of operations in a fourth country, and receive supplies and other aid from a fifth country.

##### 2. Counterdrug Operations Vignette

The following series of figures uses a counterdrug operation vignette to show how analysts can think about nodes, links, and the way a system works in order to identify key nodes and the potential actions against them to create the desired effects relative to the system to support achievement of the objectives. In this vignette, the CCCR has tasked the J-2 to analyze an existing narcotics network and collaborate with the J-5 and interagency representatives to determine how to ensure that a key country’s powerful **insurgent organization does not receive funding from the narcotics trade** (the CCCR’s objective). The J-2 develops an understanding of how the regional narcotics system functions, and then determines the best way to present this to the J-5 and CCCR so they can develop COAs and design a CONOPS. During this process, intelligence analysts use tools such as *association matrices* and *measures of node centrality* described in Chapter II, “The Process for Joint Intelligence Preparation of the Operational Environment.” The J-2 presents the results to the commander and staff graphically using a series of *network analysis diagrams* to describe the narcotics network’s operations.

a. In this region of the CCCR’s area of responsibility, opium is used as a form of microfinance. Often, farmers ❶ will take loans, occasionally of goods-in-kind, based on

the promise to grow opium and repay the loan with the produced opium. This may allow a farmer to get through a particularly harsh winter or obtain particularly expensive things (car, house, wife, etc.). Socially, there is a clear prohibition against the production of illicit narcotics and almost all farmers recognize and agree with the prohibition. However, most opium farmers simply cannot ignore the economic realities of opium farming. In many cases, the opium broker also will run a legitimate business that also deals in opium in the local bazaar ❷. See Figure C-1.

b. **Figure C-2:** The J-2 knows that the real money-making step in the narcotics system is the conversion of opium to heroin. Opium is valuable as an ingredient of heroin. The opium is converted to heroin in **labs** ❸. The term “lab” means any place the precursors, opium, and chemists are. No sophisticated tools are required. A lab may be a simple hut. Precursor chemicals must be smuggled into country and can be obtained either directly from the **smuggling networks** ❹ or often at local **bazaars** ❷. While there are legitimate uses for many precursor chemicals worldwide, none exist in country. “**Chemists**” ❺ are the people with the knowledge of how to convert opium into heroin. The J-2 knows that these are not chemists in any Western sense. Many have no idea about chemistry at all, and may even be illiterate. They do, however, know the “recipe” to convert opium to heroin, which is a limited skill in the region.

c. **Figure C-3:** There is little narcotics use in country (given the extreme poverty, there would be little profit in that market). Therefore, heroin has to be smuggled to **overseas markets** ❻. **Narco-barons** ❼, typically based in country, are key individuals who control vast segments of the country’s narcotics trade and have access to massive wealth (probably 100s of millions to billions of US dollars). Many have sizable personal militias. They are the primary profit makers from the sale of narcotics overseas. Their primary means of getting money from the overseas’ markets is through **banks** ❽ and the use of the **hawala** ❾. Narco-barons may also exert direct control over the smuggling networks ❹, certain “chemists” ❺, the labs ❸, and opium brokers ❷. Additionally, by using their immense wealth narco-barons are often able to obtain political protection from local and national **politicians** ❿.

d. **Figure C-4:** Current intelligence supports the conclusion that the insurgents (11) benefit indirectly from the narcotics trade. The insurgents almost certainly obtain funds by “taxing” farmers ❶ and opium brokers ❷ in areas where they have a strong presence. The insurgents also probably receive sizeable contributions from narco-barons ❼. This may be a form of protection payments, but narco-barons may also seek to perpetuate the lack of enforcement enabled by the continuing instability created by insurgent operations. Also, the same smuggling networks ❹ responsible for moving narcotics out of country also are likely responsible for the “backflow” movement of arms and personnel into country, directly benefiting the insurgents.

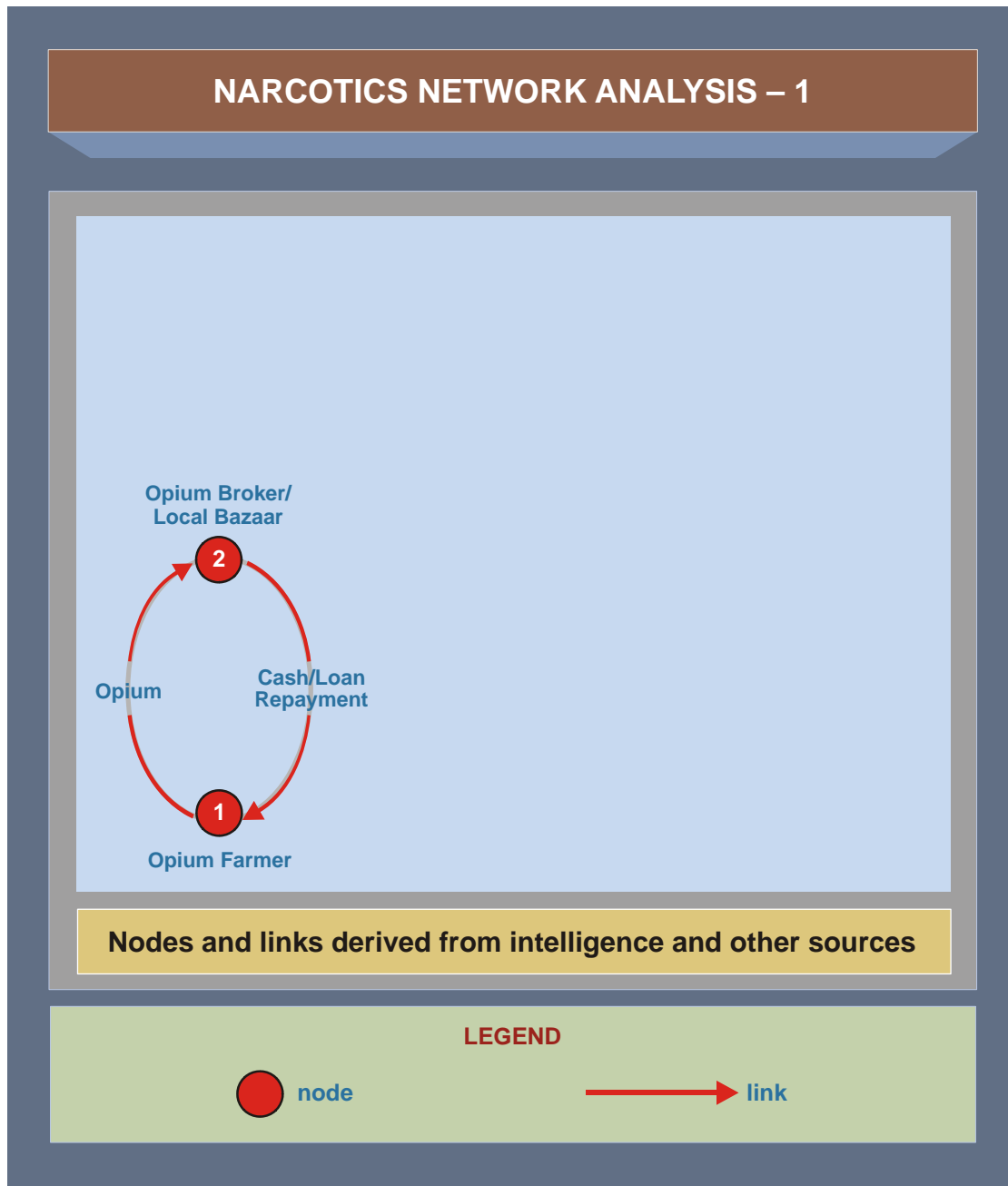


Figure C-1. Narcotics Network Analysis -1

e. As intelligence analysts have been refining their understanding of the narcotics network, they have been considering how best to prevent the insurgent organization from receiving funding from the narcotics trade. Analysts conclude that the nodes and links directly related to the conversion of opium to heroin are important, and that the country's labs and their chemists are key to the entire system. Perhaps opium could be smuggled



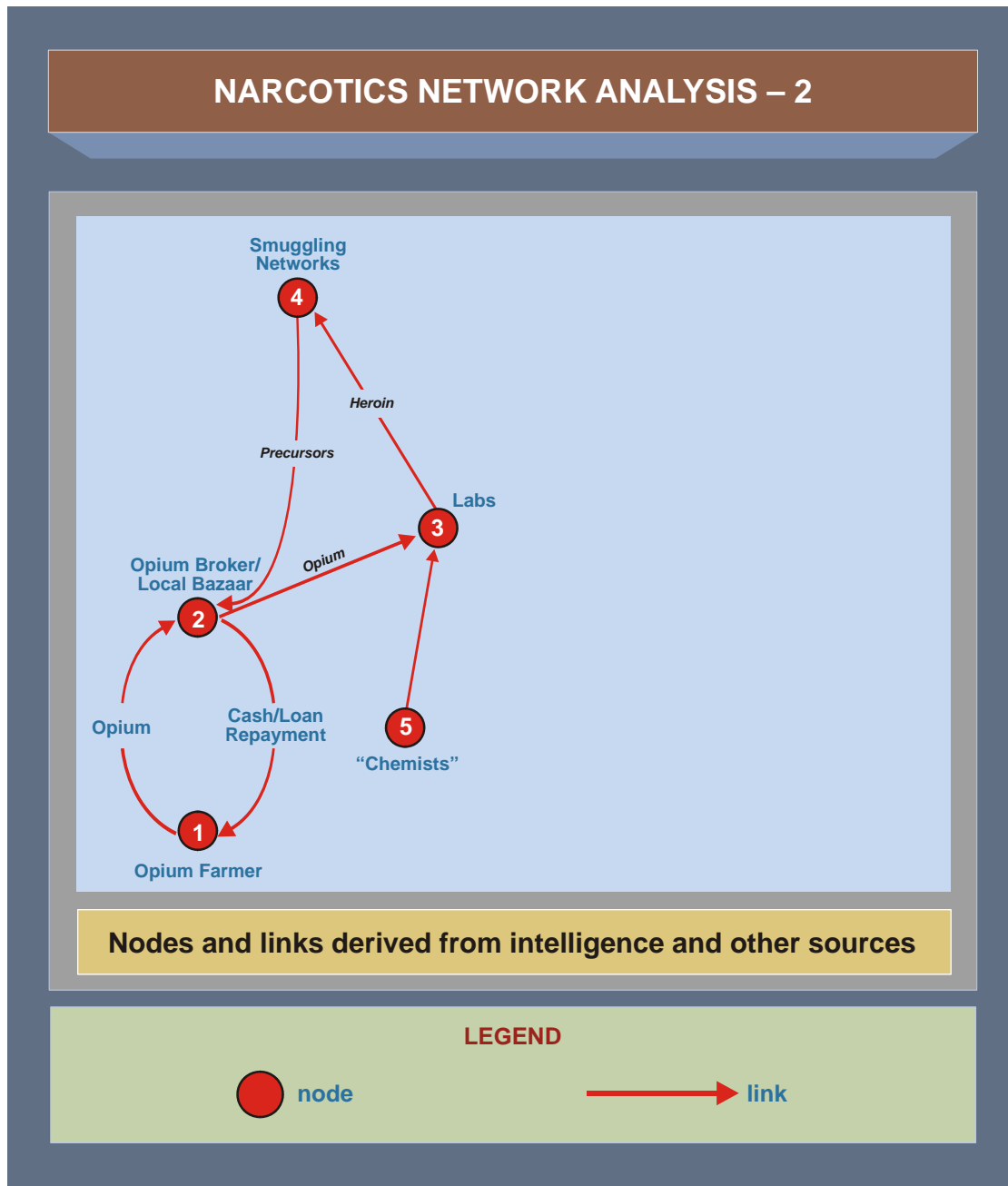


Figure C-2. Narcotics Network Analysis - 2

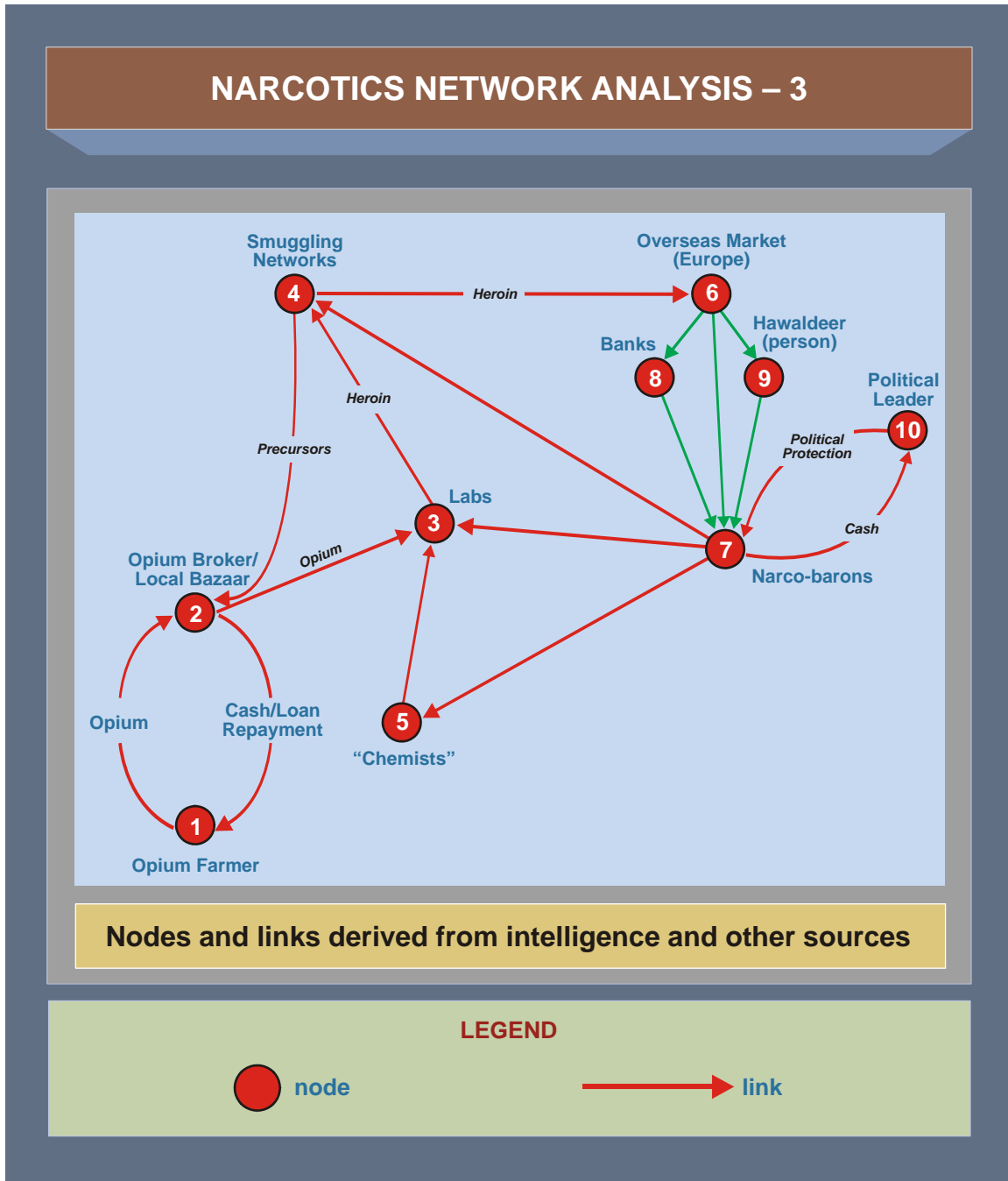


Figure C-3. Narcotics Network Analysis – 3

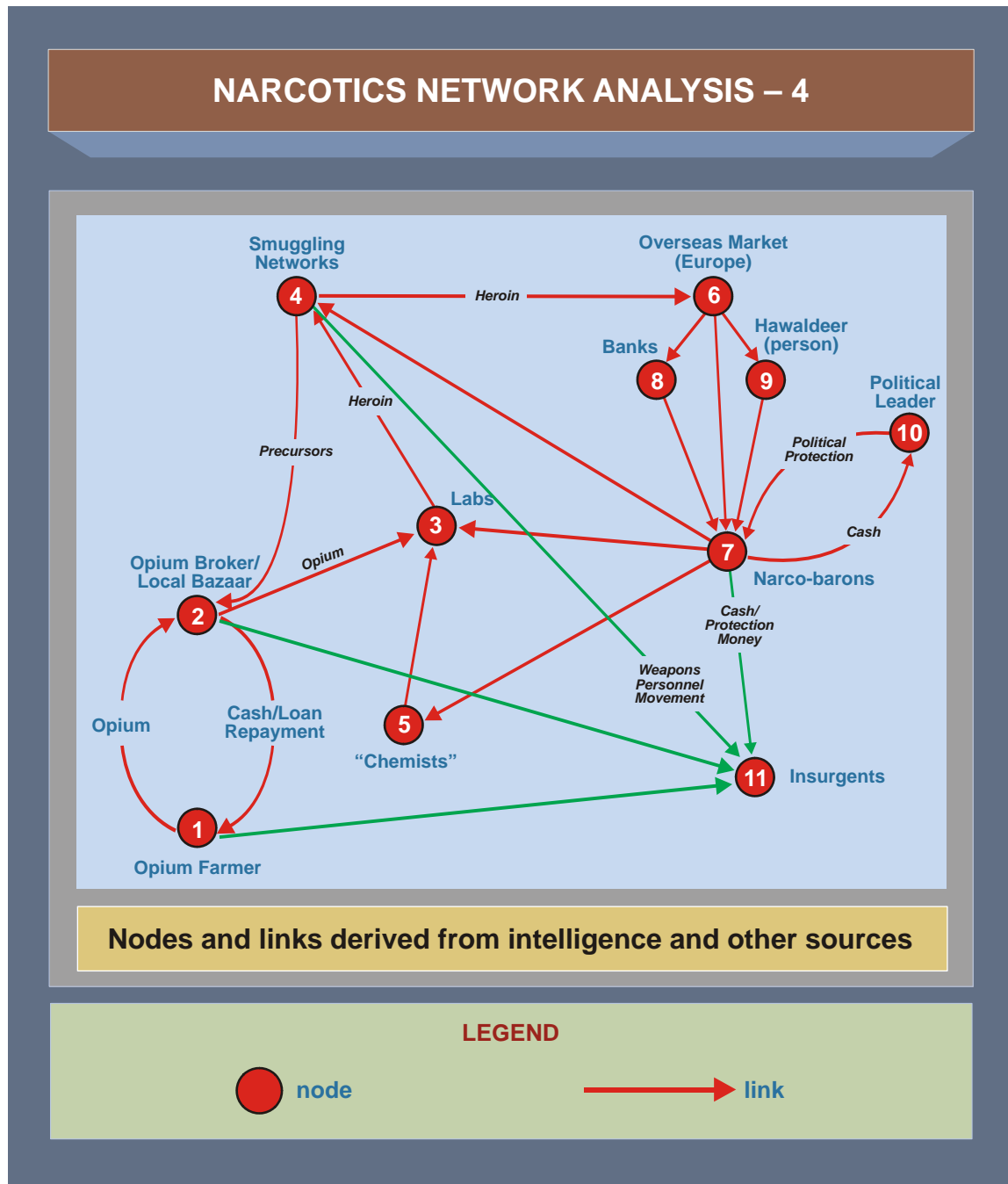


Figure C-4. Narcotics Network Analysis – 4

out of country and the conversion could occur at labs in other countries. But this is much more difficult for the opium brokers, and severely reduces the profitability of narcotics in country. Since the conversion occurs in the labs, attacking them directly could affect the entire system. But these makeshift labs are transient (where the right people and material are present for brief periods), and may be too difficult to identify and interdict.

f. **Figure C-5:** How then can the joint force affect the ability of the labs to convert opium to heroin? The J-2 identifies three factors that could limit lab operations. First, the joint force can work with the host country to interdict the supply of opium (❶ and ❷) to the labs. Second, interdicting the precursors (❷ and ❹) is likely to have a significant impact on labs. Third, the knowledge of how to convert opium to heroin is limited to the chemists, so identifying, locating, and confining a sufficient number of chemists ❺ should have a huge impact on labs. Success in these three areas should limit heroin production and movement overseas, reduce the amount available in overseas markets, and reduce or eliminate the flow of money to the insurgents from the sale of narcotics. The J-2 also assesses that given the wide-ranging influence the narco-barons ❷ exert on the narcotics trade, interdicting them directly also is likely to have a significant impact on the system. Since the labs and the chemists are commonly collocated and vital to the production of heroin, the J-2 designates them as key nodes in the network (see discussion of key nodes in Chapter II).

g. **Figure C-6:** Collaboration between the J-2, J-5, and other selected staff members has increased as the J-2 develops a more comprehensive understanding of how the narcotics network functions. In particular, the J-5 becomes fully involved at the point of considering potential actions (to include all instruments of national power) that can influence the network to create effects to support achievement of the objectives. The combatant command's JIACG likely will participate in this process. The process will evolve later to development of potential COAs and a CONOPS, but the present focus is on identifying discrete actions against specific nodes in the system. Once the J-2 briefs the participants, this cross-functional group identifies a number of possible actions.

(1) Diplomatic. Apply pressure against political leaders ❿ to cease their political protection of narco-barons; share information with international banks ❸.

(2) Encourage opium farmers to accept alternative means of income to opium production. Synchronize public affairs and psychological operations to inform farmers about alternatives and to influence their acceptance and implementation of them.

(3) Military. Capture and arrest narco-barons ❷; capture chemists ❺ and destroy labs ❸; interdict smuggling networks ❹ to cut flow of precursors.

(4) Economic. Freeze narco-barons' assets at international banks ❸; work with host country to provide economic alternatives for opium farmers ❶.

h. The J-5 can now develop alternative COAs based on the J-2's systems analysis and an understanding of potential actions against various nodes. Interagency collaboration during COA development is essential in this example, because the

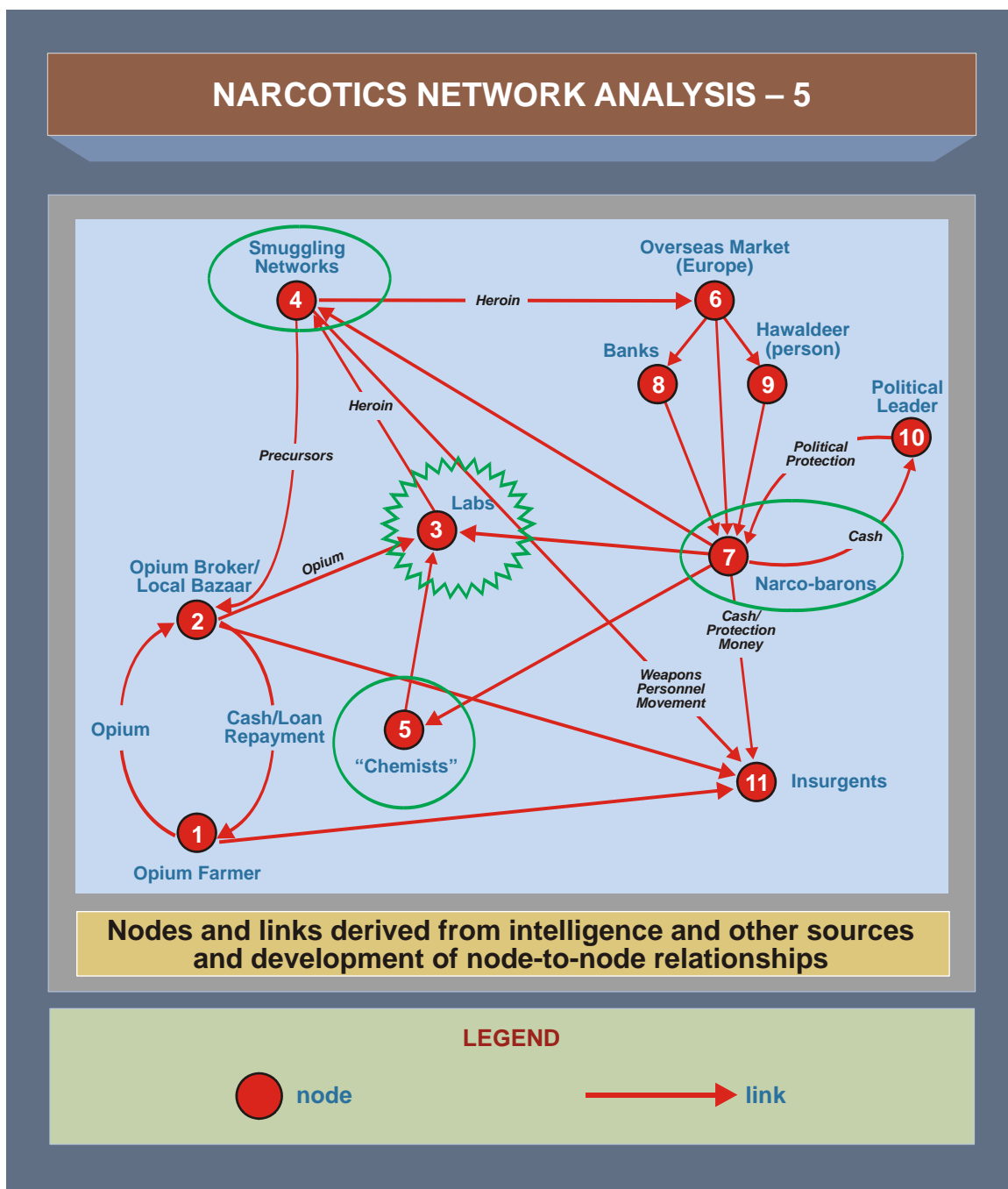


Figure C-5. Narcotics Network Analysis – 5

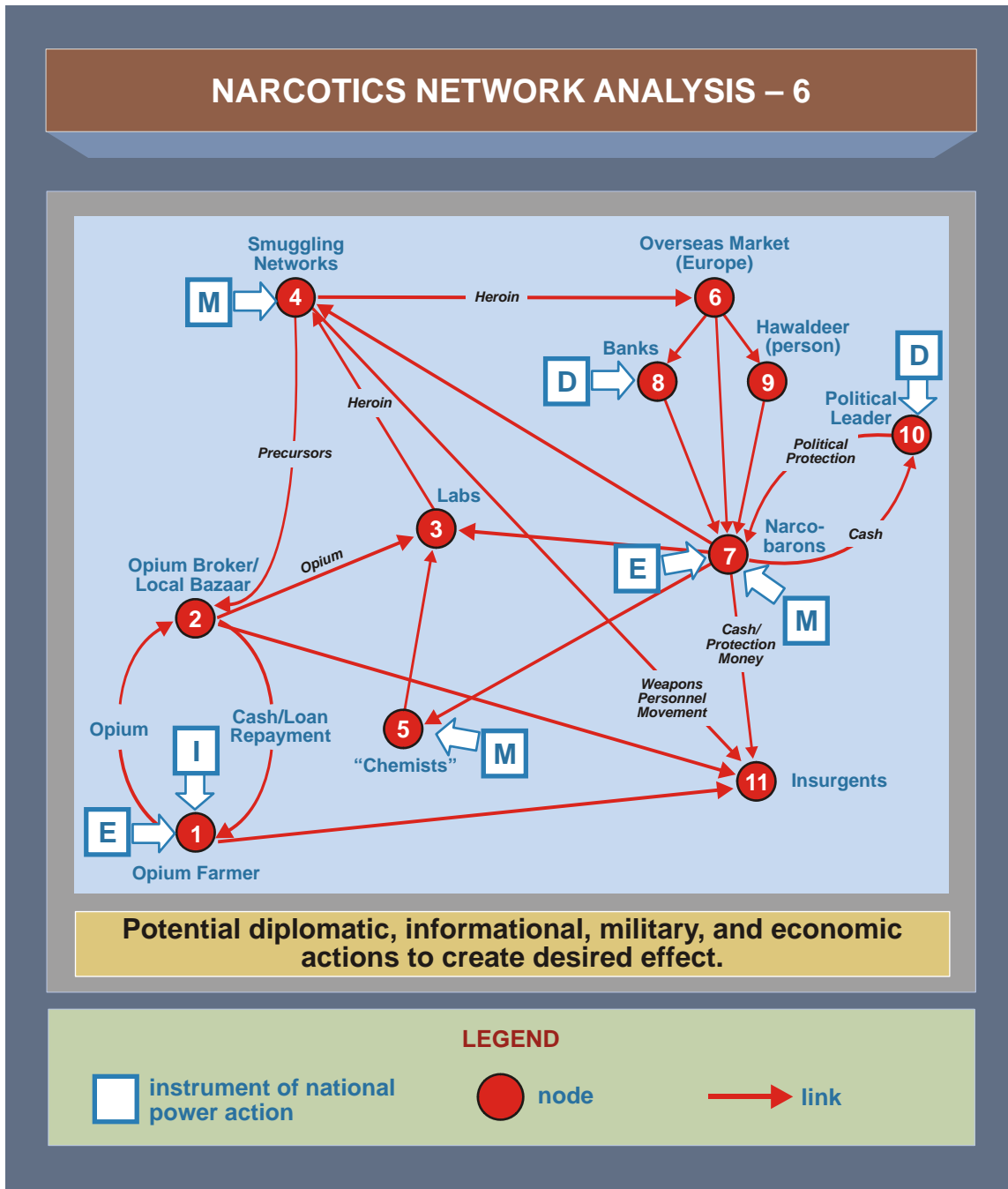


Figure C-6. Narcotics Network Analysis 6

feasibility (and thus the validity) of a COA may depend on the agreement and capability of one or more agencies to execute specific tasks. The J-5 also must consider potential undesired effects. For example, the income alternative for opium farmers and brokers must be achievable, or they will lose operating capital and their livelihood, perhaps turning them against the larger coalition effort.

i. The foregoing is a simple hypothetical example of thinking about how a network functions, determining the key node-link relationships from the perspective of an objective that supports specified desired effects, and identifying potential actions that the joint force can take against nodes in the network to achieve that objective. The actual analysis would be significantly more complex, and would encompass a multitude of nodes and links across PMESII systems and subsystems. Although the J-2 leads this analysis as part of JIPOE, the effort is cross-functional in nature, with participation from the rest of the joint force staff and various military and other agency representatives based on the JFC's desired effects to contribute the conditions necessary to achieve his objectives. Clearly displaying the relevant networks and their key node-link relationships in a graphical component of the intelligence estimate and other intelligence products can greatly enhance the JFC's and staff's understanding of how the networks function and how they can be affected.

### SECTION B. TYPICAL PMESII SYSTEMS AND SUBSYSTEMS

Figures C-7 through C-12 in this section depict typical PMESII systems and subsystems. Understanding the composition and interaction of systems relevant to the joint operation at hand will help the JFC and staff determine how best to set the right conditions to achieve objectives and accomplish the mission. The composition of relevant systems will vary from country to country and from operation to operation. As the examples in Section A demonstrate, some systems will be “transnational” rather than purely “nation-state” in nature. Awareness of these variations from operation to operation will help the JFC avoid the creation of undesired effects.

#### 3. The Political System

The political system is comprised of the central and local governments, political organizations (including political parties and interest groups), and regional/international actors who receive and process political system demands (see Figure C-7). Consideration for analysis include:

- a. The predominant political ideology and what and who constitutes its major defining policies.
- b. Sense of national identity to include strengths or weaknesses.
- c. The constitutional basis for government.
- d. Assessment of the quality of governance.
- e. Separation of powers from religion and state.
- f. Degree of centralization of power between the military and state.
- g. Role ethnic and religious groups play in government



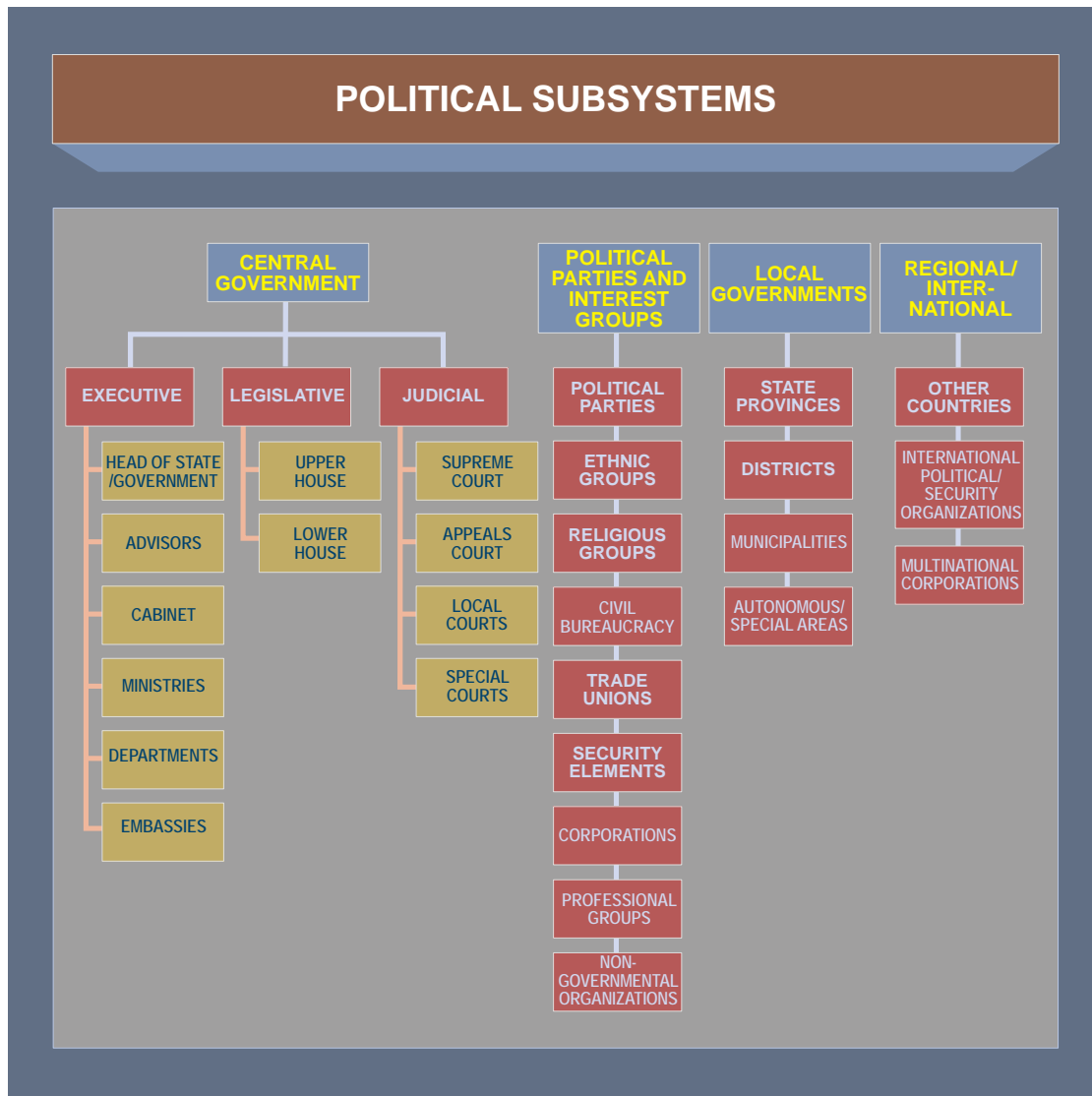


Figure C-7. Political Subsystems

- h. Strength of political influence on the military.
- i. Toleration (or presence of) opposition groups.
- j. Characterization of political relationships with regional neighbors to include points of friction.

#### 4. The Military System

The analyst examines a military system in regards to national objectives, protection of the government, and that country's population. Components of subsystems (see Figure C-8) are examined in order to identify essential subsystems and assess the value those subsystems provide to the system as a whole. Consideration for analysis include:

- a. Military role in the development of national strategy.

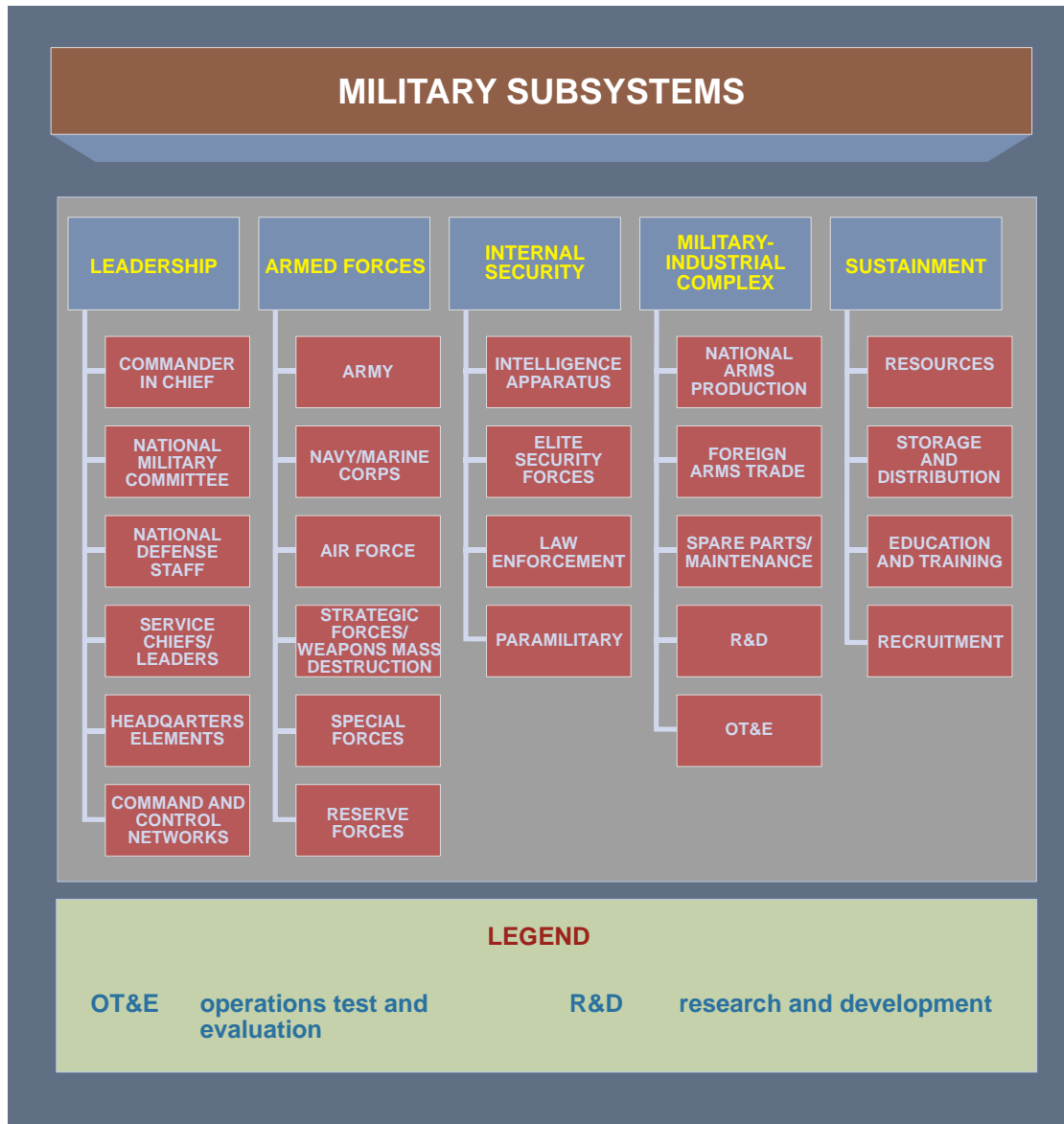


Figure C-8. Military Subsystems

- b. Potential and realized threats (external and internal).
- c. Characterization of military and civilian relationship.
- d. Role of demographics in military leadership.
- e. Factors regarding the development and maintenance of a military.
- f. Influences (positive and negative) affecting combat readiness.

## 5. The Economic System

The analyst examines an economic system in regards to the sum total of production, distribution, and consumption of all goods and services in a country (see Figure C-9). That sum can be thought of as the combination of the formal and informal economies. Considerations for analysis include:

- a. Type of economic model (capitalism, social, other).
- b. Major industrial engines of the economy (manufacturing textile/apparel, vehicle, or machine tools).
- c. Agriculture base.
- d. Economic relationship with other countries and with international trade (imports, exports and the balance of payments).
- e. Health of domestic markets.
- f. Opportunities available for people to borrow money or own businesses.

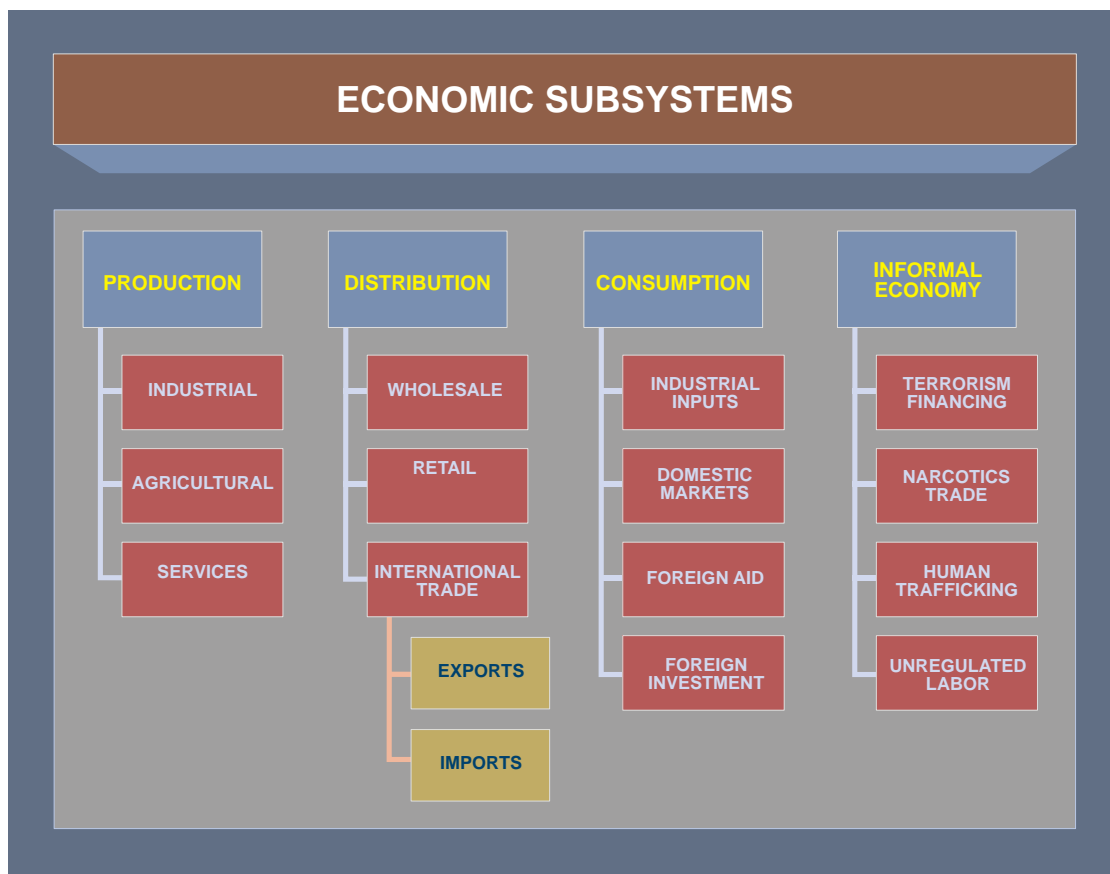


Figure C-9. Economic Subsystems

- g. Relationship with the country to foreign investors and the international community for foreign aid and debt relief.
- h. Labor force - skilled and fully employed.
- i. Factors regarding the informal economy (terrorist financing, narcotics trade, trafficking in humans, unregulated labor and smuggling).
- j. Impact of corruption, accountability and transparency on the economic system.
- k. Sources of economic tension.

## 6. The Social System

The goal of the analyst is to identify the system's framework (see Figure C-10) in order to evaluate and dissect social interactions. Considerations for analysis include:

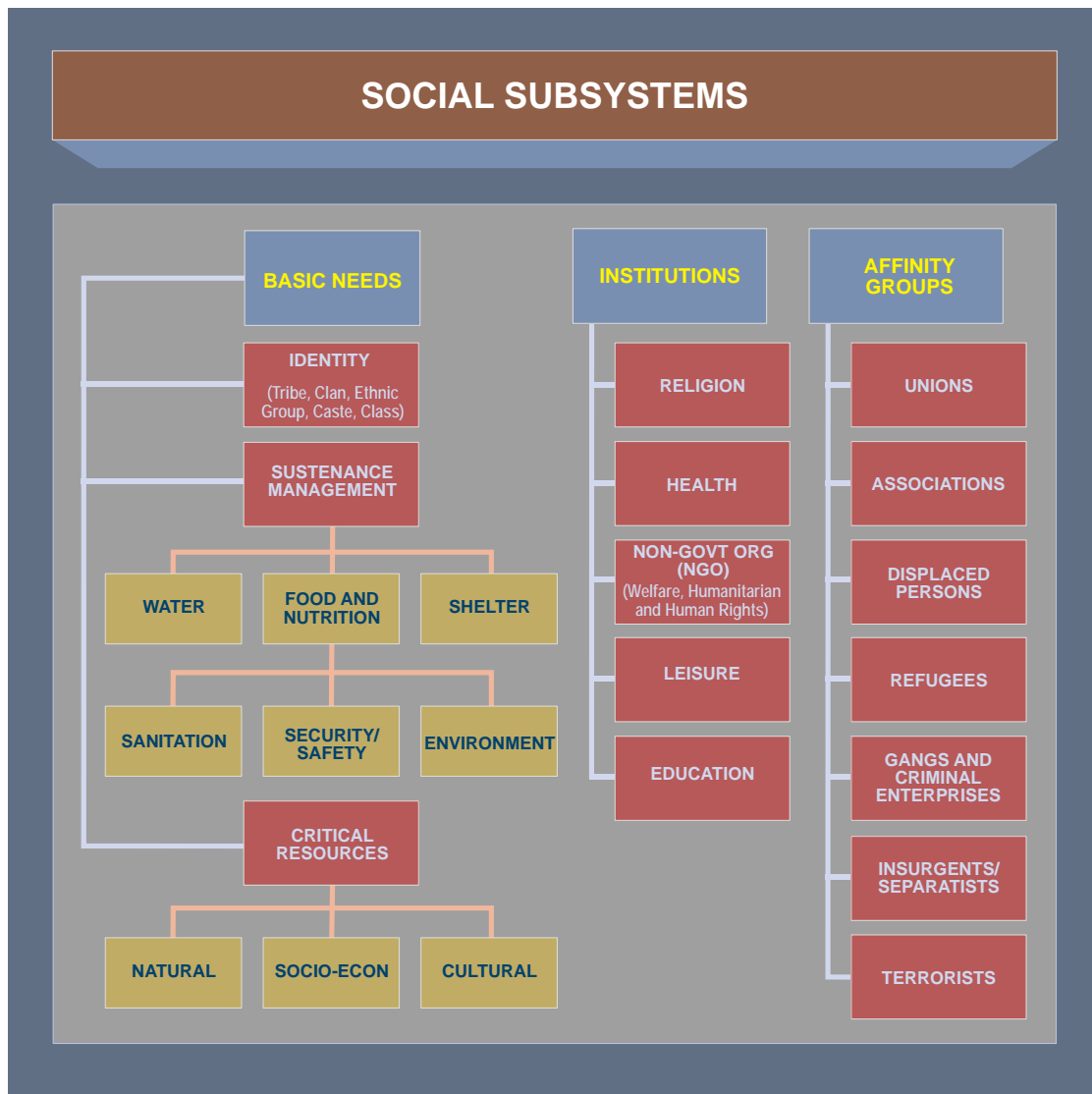


Figure C-10. Social Subsystems

- a. Cohesion of socio-religious groups.
- b. Causes of societal pressures and discontent
- c. Impact of immigration and emigration.
- d. Availability of food and medical supplies.
- e. Educational and economic opportunities.
- f. Role of IGOs and NGOs.
- g. Types and extent of crime.
- h. Presence and impact of separatist and terrorist groups.
- i. Cultural differences among population.
- j. Tolerance for religious freedom.

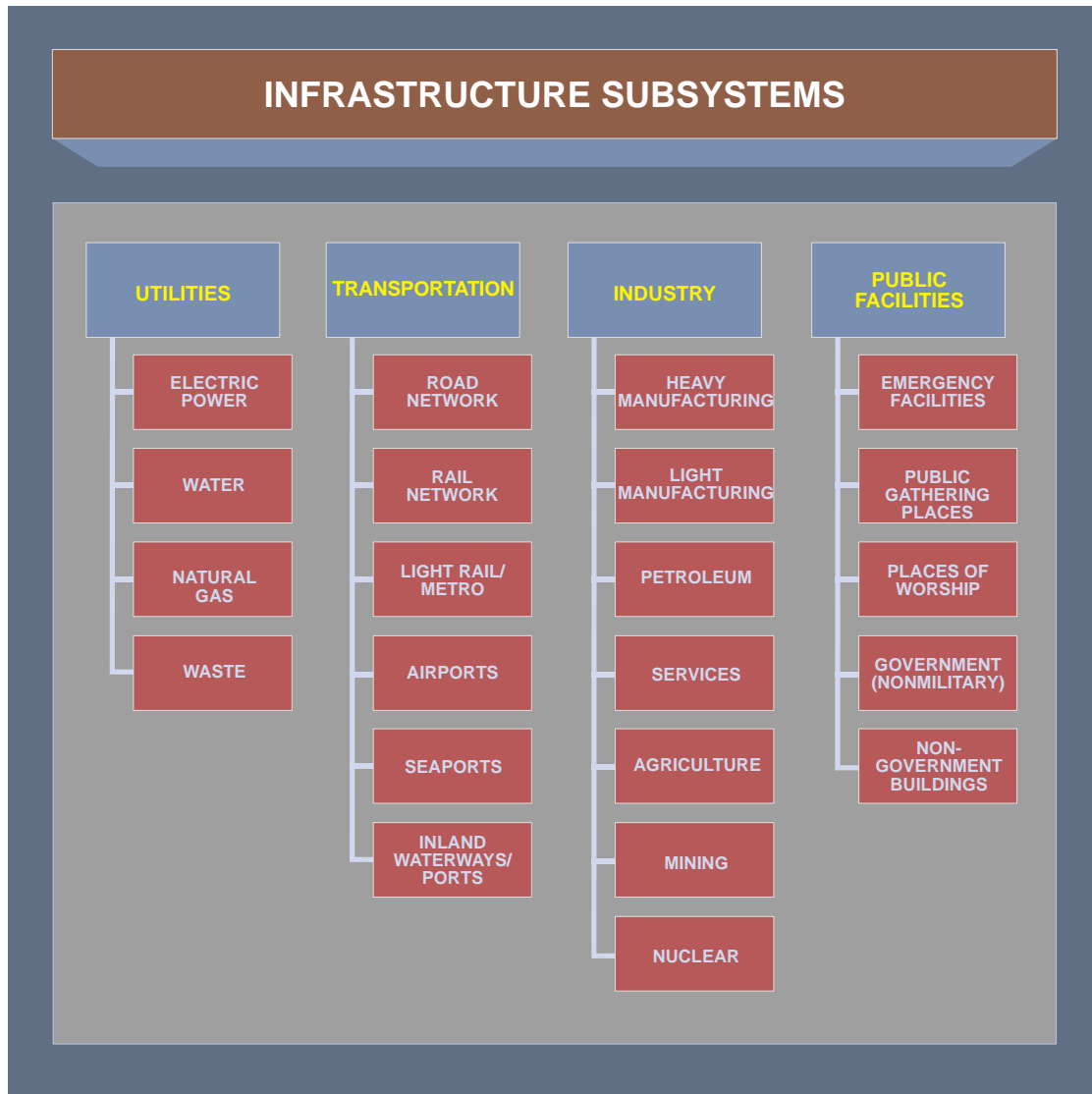
## **7. The Infrastructure System**

Primary subsystems of an infrastructure system include: utilities, transportation, industry, and public facilities (see Figure C-11). Research is dedicated to the discovery of relationships, dependencies, and vulnerabilities within and across various infrastructure subsystems. Considerations for analysis include:

- a. Utility network which supports industry and the population.
- b. Sufficiency of water and wastewater facilities.
- c. Adequacy of transportation network.
- d. Contribution of industrial facilities to the economy and national self-sufficiency.
- e. Adequacy of public facilities meeting the needs of the population.

## **8. The Information System**

Research is dedicated to the examination of an information system in regards to national objectives, communication capabilities, and operations in support of a focus area. Primary subsystems include: global information, national information, and defense information networks (see Figure C-12). Essential subsystems must be identified and assessments made as to the relative value essential subsystems provide to the system as a whole. Considerations for analysis include:



**Figure C-11. Infrastructure Subsystems**

- a. Capabilities of national communications systems.
- b. Location of critical communications facilities.
- c. Foreign support to internal telecommunications.
- d. Programs that support national, technical, and academic research.
- e. Assessment of hardware and software technology standards.
- f. Censorship of the media.

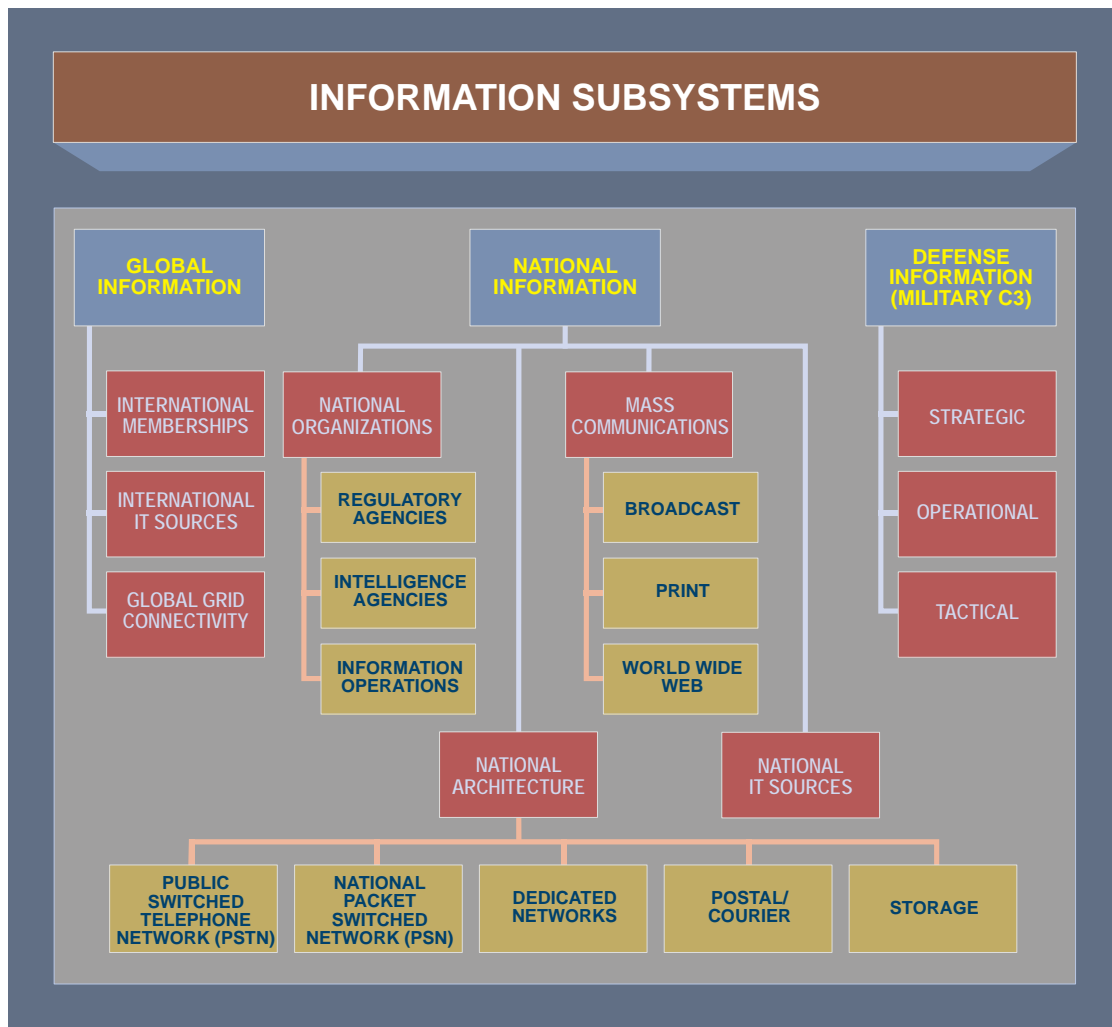


Figure C-12. Information Subsystems



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## APPENDIX D SPECIALIZED PRODUCTS

### 1. Overview

The basic JIPOE process provides a disciplined methodology for analyzing the operational environment and assessing the impact of that environment on adversary and friendly COAs. The process makes extensive use of graphic displays. Some of these graphics (such as MCOOs, situation templates and matrices, and event templates and matrices) are integral to the four step process. However, depending on the situation, additional, specialized, graphic displays may be developed to support and provide greater clarity to the JIPOE effort. The following discussion illustrates some of the more common types of JIPOE specialized products currently in use. Additional products tailored to specific situations may be devised by local JIPOE analysts limited only by their intelligence, imagination, and creativity.

### 2. Infrastructure Overlay

Infrastructure overlays identify those infrastructure assets of significance to the joint operation and/or the well-being of the civil population. These overlays should identify which assets are key infrastructure and depict their vulnerabilities (see Figure D-1). By identifying key infrastructure and their vulnerabilities in combination with the known capabilities and intentions of indigenous terrorist or insurgent groups, the JFC can employ security countermeasures in an appropriate, cost-effective, and rational manner.

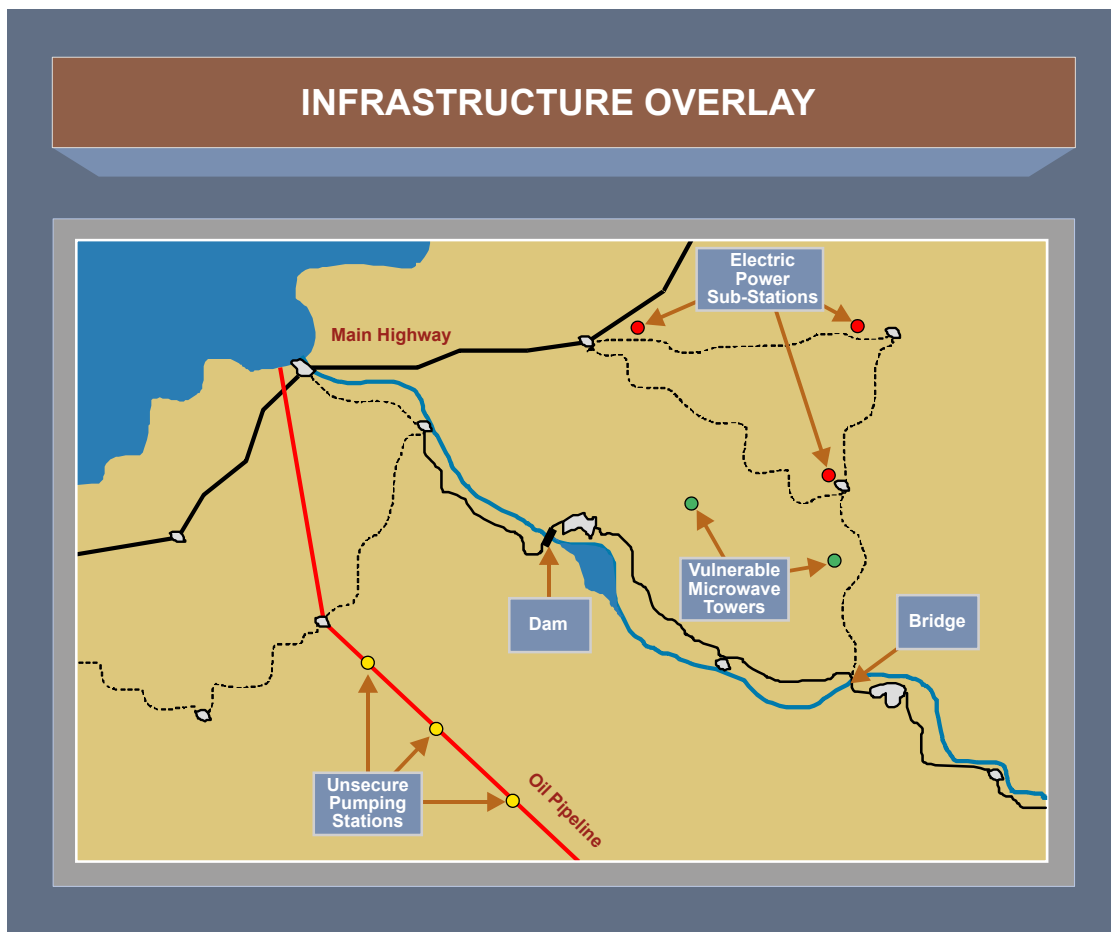


Figure D-1. Infrastructure Overlay

### 3. Primary and Secondary Route Overlay

Primary and secondary route overlays may be used to assist in transportation planning in a variety of situations (e.g., NEO, WMD interdiction, antismuggling). These overlays identify likely primary and secondary routes based on the characteristics and capabilities of the transportation infrastructure such as bridge classifications, road surface, or rail gauge. The analysis should also include associated considerations such as possible ambush sites and the locations of supporting emergency service infrastructure (e.g., police stations, hospitals). Figure D-2 shows an example of a primary and secondary route overlay.

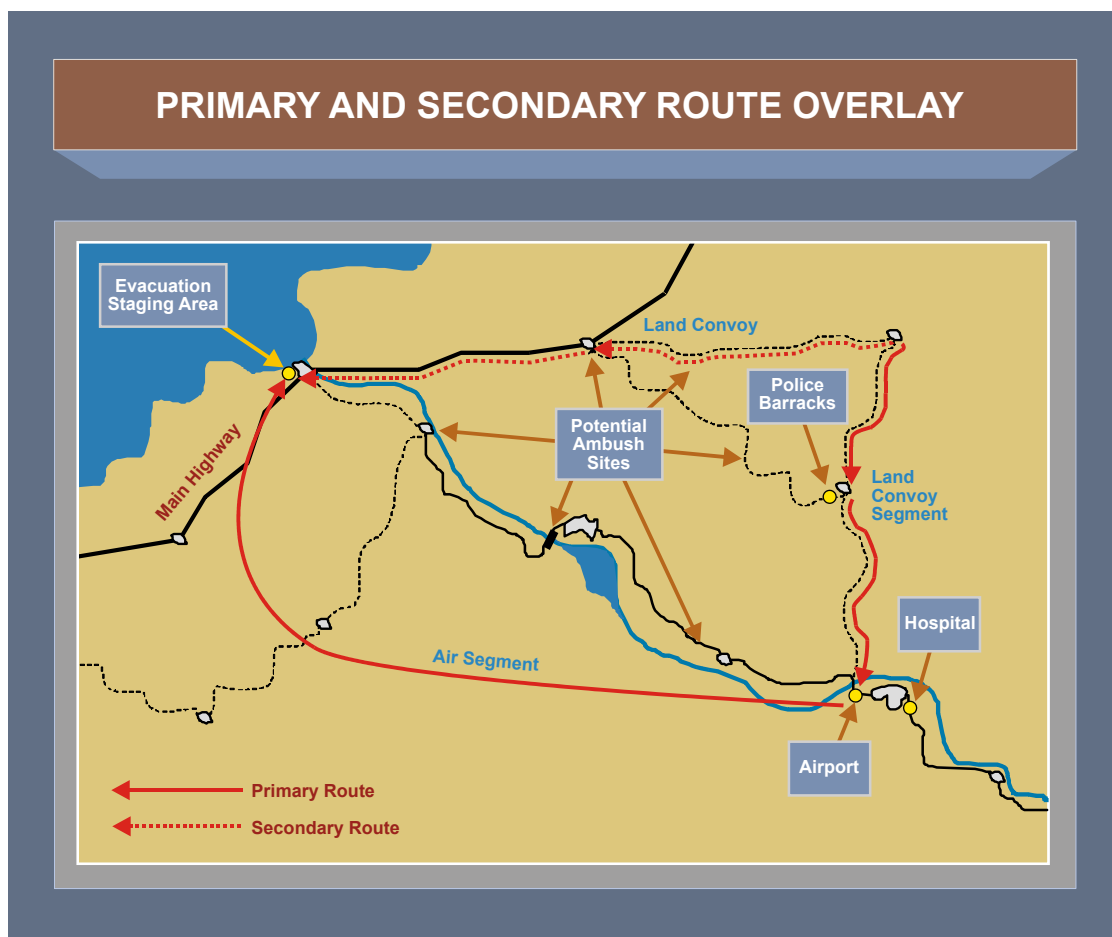


Figure D-2. Primary and Secondary Route Overlay

#### 4. Pattern Analysis Plot Sheet

Pattern analysis plot sheets help distinguish patterns in activities associated with particular days, dates, or times that are depicted by the rings and segments in Figure D-3. Analysts may choose to modify this product to track longer or shorter period as appropriate.

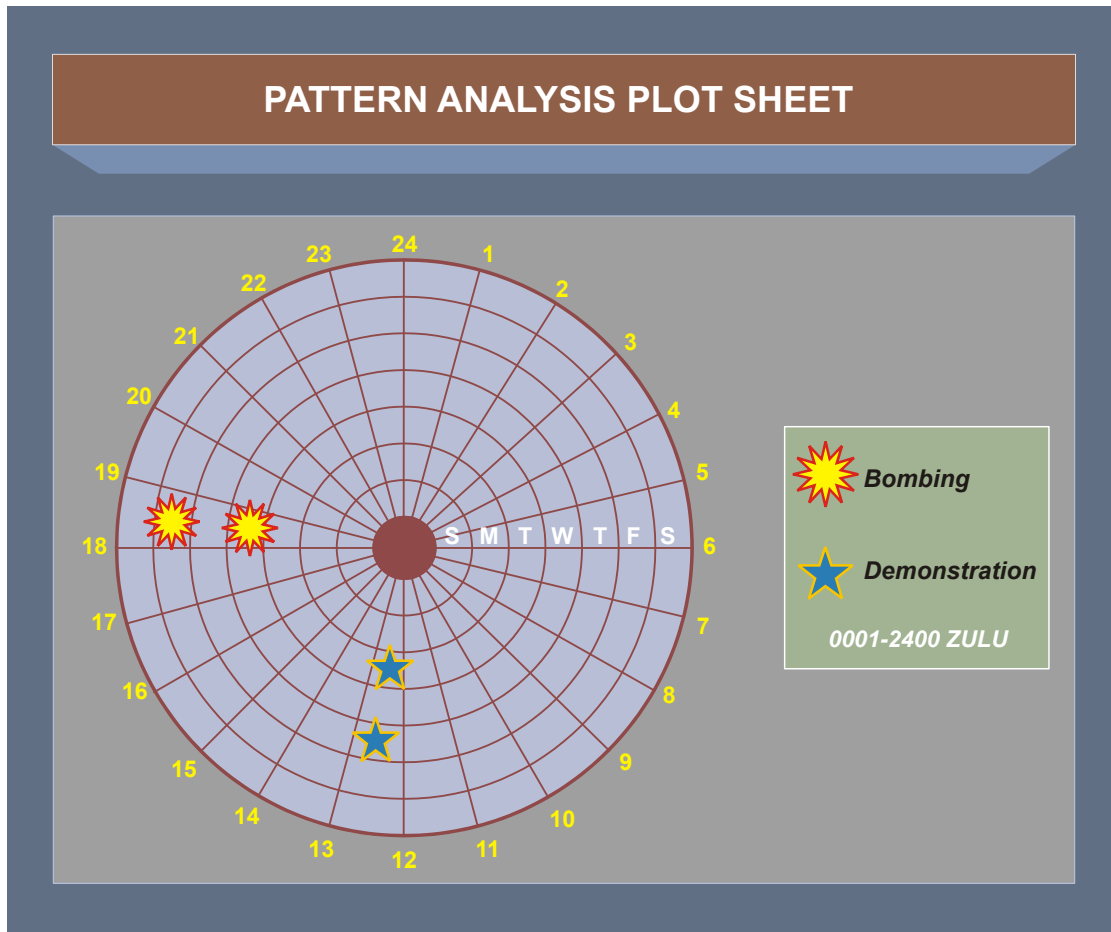


Figure D-3. Pattern Analysis Plot Sheet

## 5. Quarantine or Contaminated Area Overlay

Quarantine or contaminated area overlays may be used to delineate areas that are off limits or quarantined due the presence of disease outbreaks, toxic industrial chemical, or CBRN contamination (see Figure D-4). Such overlays are useful during consequence management operations or in response to pandemic disease outbreaks.

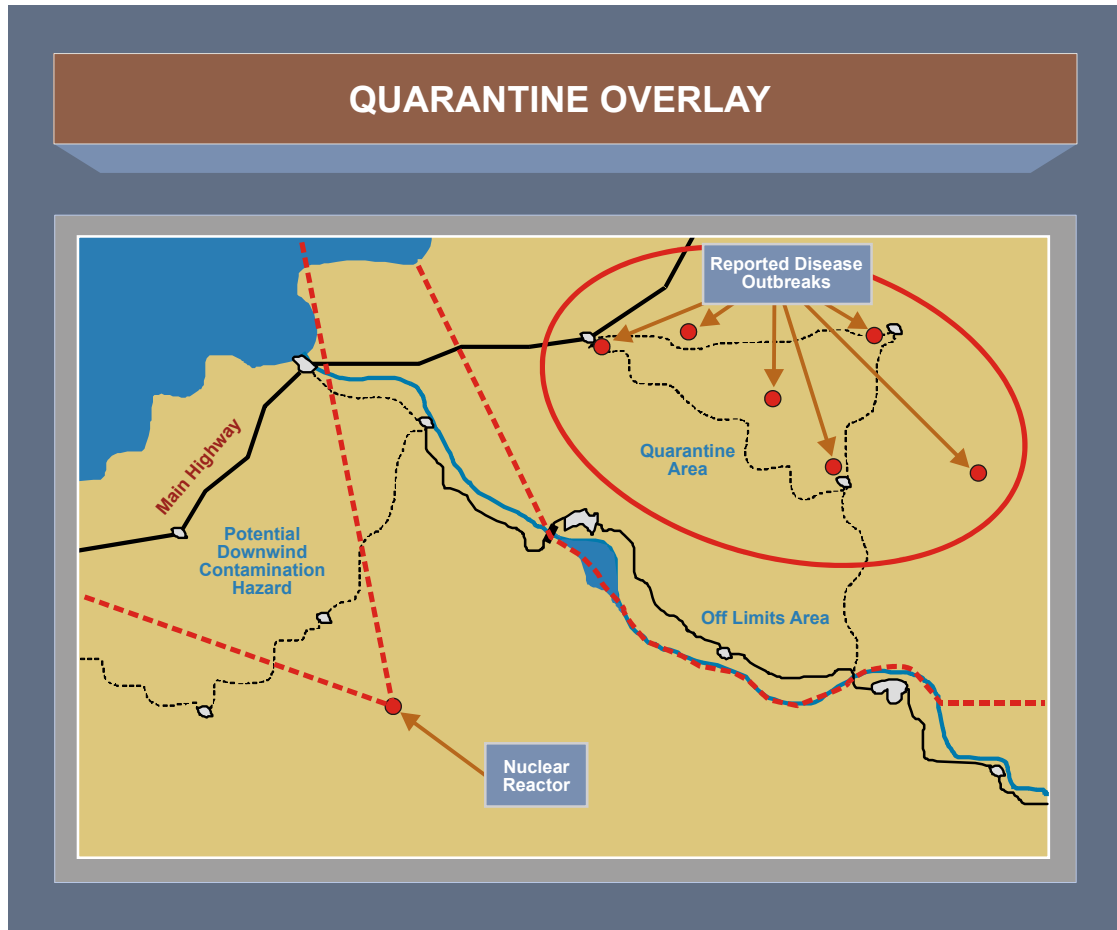


Figure D-4. Quarantine Overlay

## 6. Population Support Overlays

The population support overlay can graphically depict the sectors of the populace that are progovernment, antigovernment, proinsurgent, antiinsurgent, uncommitted, and neutral (see Figure D-5). These overlays are important because they help analysts determine whether the local populace is likely to support the HN government or support the insurgency.

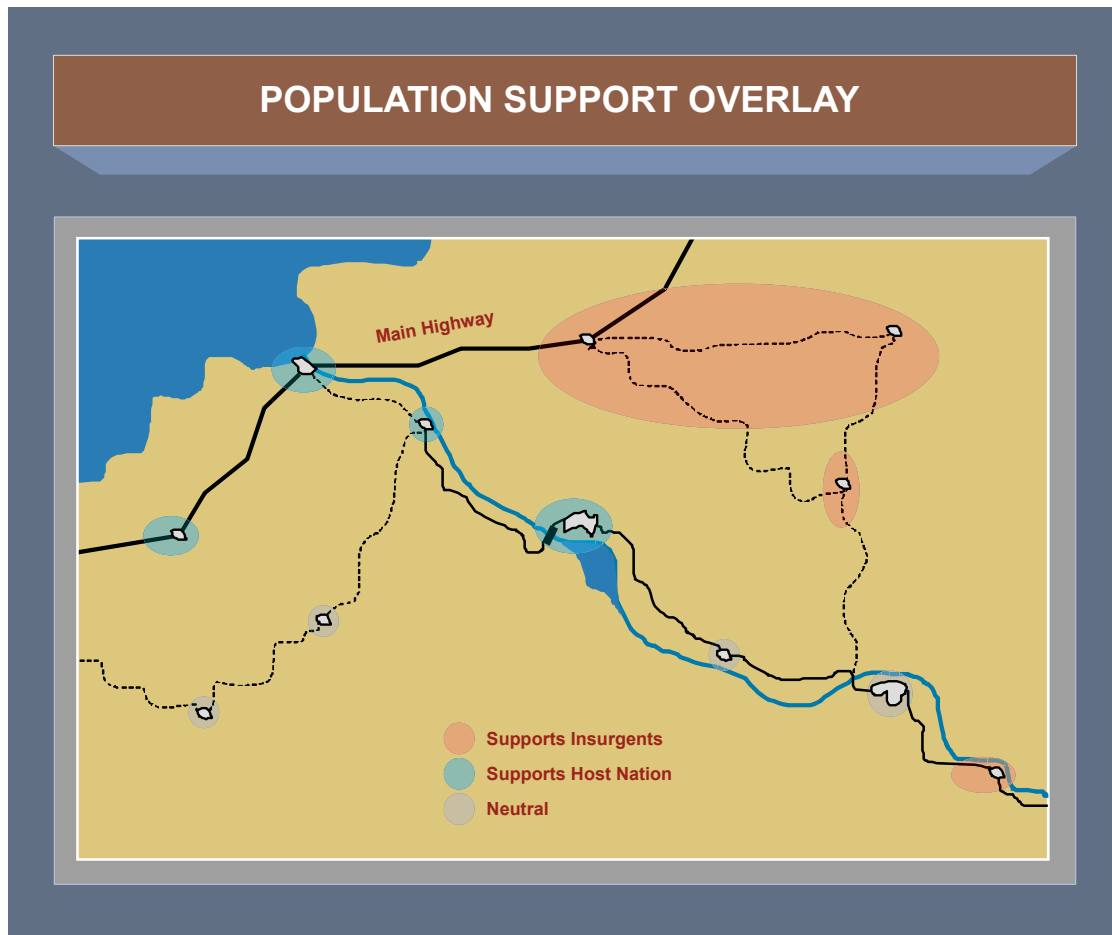


Figure D-5. Population Support Overlay

## 7. Legal Status Overlays

Legal status overlays may be constructed to depict the impact on the operational environment of established or planned ROE and international law (see Figure D-6). These overlays display actual or potential “no-strike” areas.

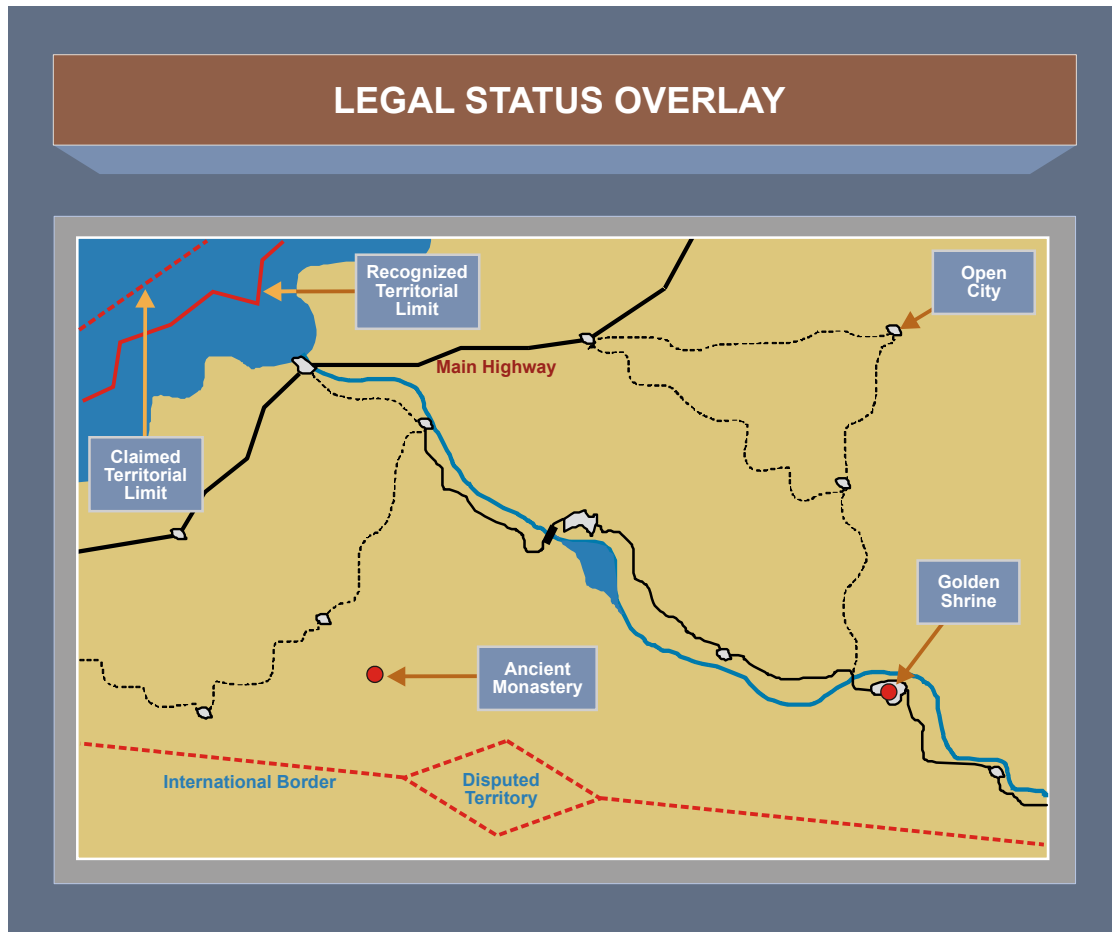


Figure D-6. Legal Status Overlay



## 8. Religion, Race, and Ethnicity Overlays

Religion, race, and ethnicity issues often contribute to conflicts. Religious, race, and ethnicity overlays depict the current ethnic and religious makeup of an operational area. These overlays can also display any specific religious-, racial-, or ethnicity-specific areas and any zones of separation agreed upon by peace accords. These three overlays may be separate or combined. Figure D-7 shows an example of an ethnicity overlay.

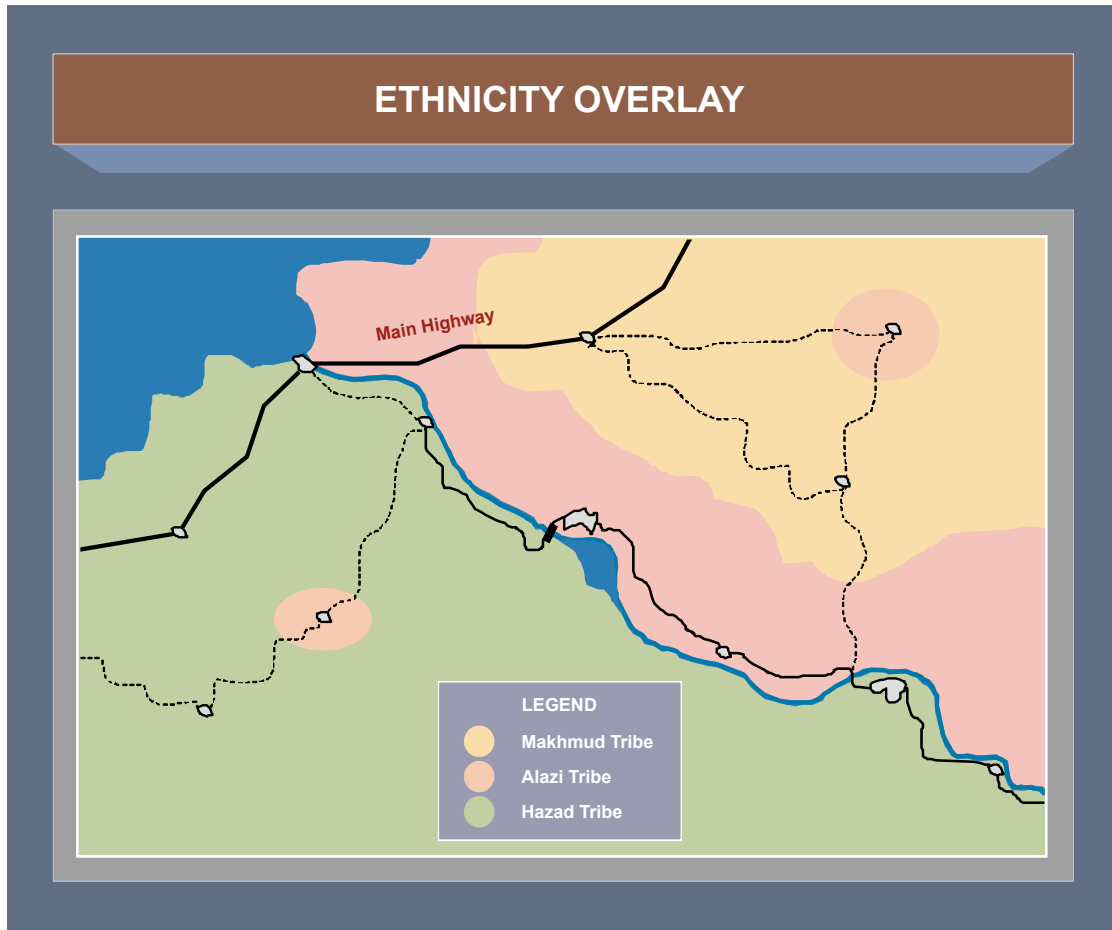


Figure D-7. Ethnicity Overlay

## 9. Perceptions Assessment Matrix

Although the perception of a host nation's population may be difficult to gauge, it is key to successfully planning, executing, and assessing joint operations. In-depth knowledge and understanding of the national, regional, and local cultures, norms, moralities, and taboos are needed to understand the operational environment and reactions of the population to friendly operations. Perceptions assessment matrices may be used to characterize and summarize public perceptions regarding various conditions (see Figure D-8).

PERCEPTIONS ASSESSMENT MATRIX								
Condition	Cultural Norm	Proposed Alternative	Population's Perception	Acceptable Difference In Perception	Root of Difference	Possible to Change Perception	Proposed Solution	Possible Consequences
<b>Food shortages</b>	Rice	Meat & potatoes	Inadequate; inconsiderate	No	Culturally accepted norms; No known physically detrimental effects	No	Offer potatoes; Seek exchange for rice	Starvation; rioting
<b>Use of firearms</b>	Criminal Elements Carry Weapons openly	Confiscate All weapons	Unfair; population not protected by traditional means	No	Culture; Criminal element provides a measure of security for population	No; population and friendly forces at risk	Psychological operations program; Weapons turn-in program	Civil unrest; armed backlash
<b>Government structure</b>	Tribal	Hierarchical	Tolerable as long as needs are fulfilled by group in charge	Yes	History	No	Bargain	Unknown
<b>Language</b>	Dual languages; Creole and Dutch	Respect all languages	Unfair; show of favoritism	Yes	History; National language	Yes	Communicate in all languages when possible	Backlash against elite and friendly forces

Figure D-8. Perceptions Assessment Matrix

## 10. Activities Matrix

Relationships (links) in large data sets are established by similarities between the nodes. Figure D-9 shows an example of an activities matrix. People are identified by their participation in independent activities. When graphed, pairs who have engaged in the same activity (columns with dots) are designated with a link on the network analysis diagram.

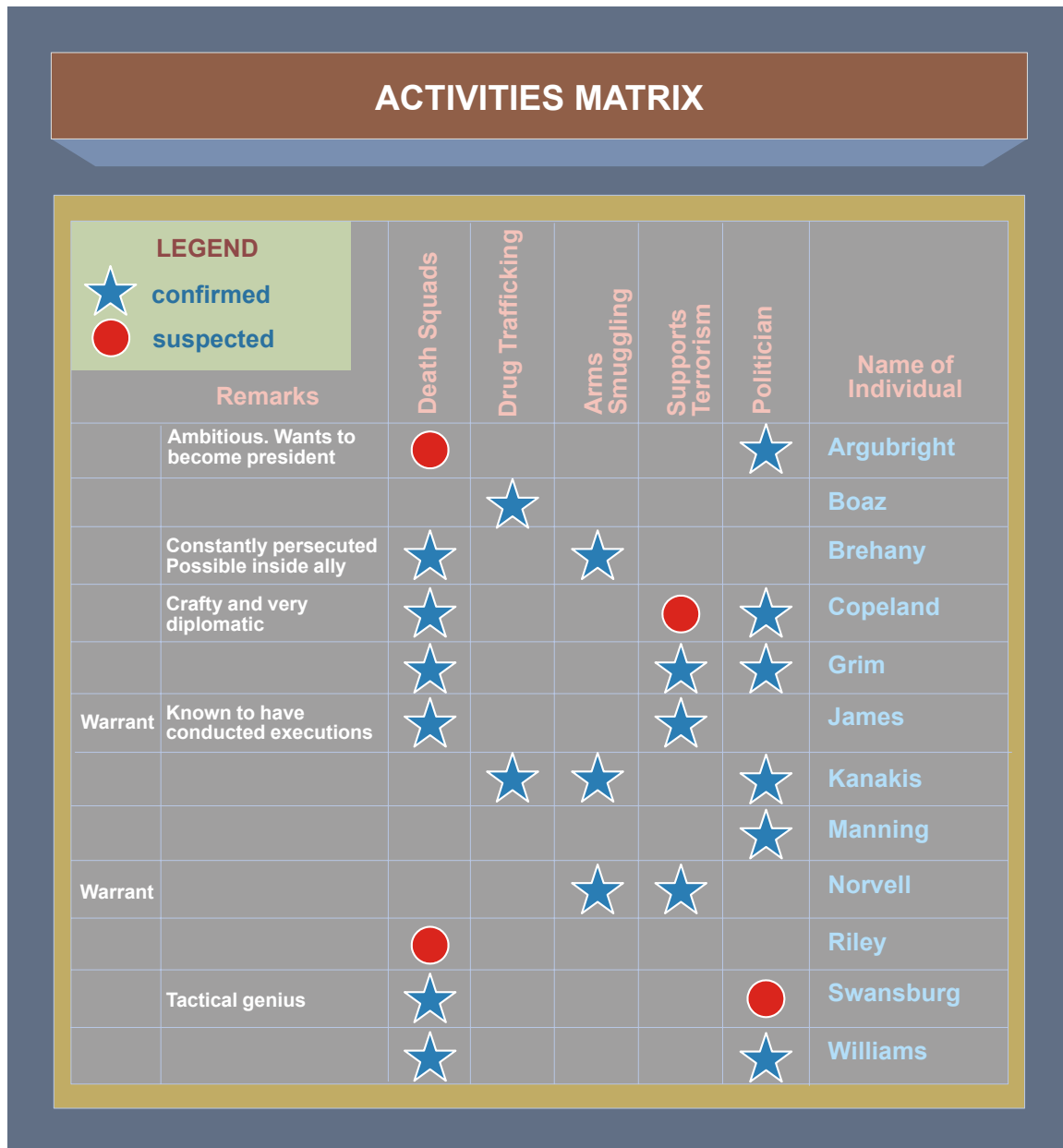


Figure D-9. Activities Matrix

## 11. Association Matrix

An association matrix portrays the existence of an association, known or suspected, between individuals or entities (see Figure D-10). Association matrices provide a relatively one-dimensional view of the relationships among entities, but can be used by analysts to help focus their attention on entities and relationships requiring greater detail.

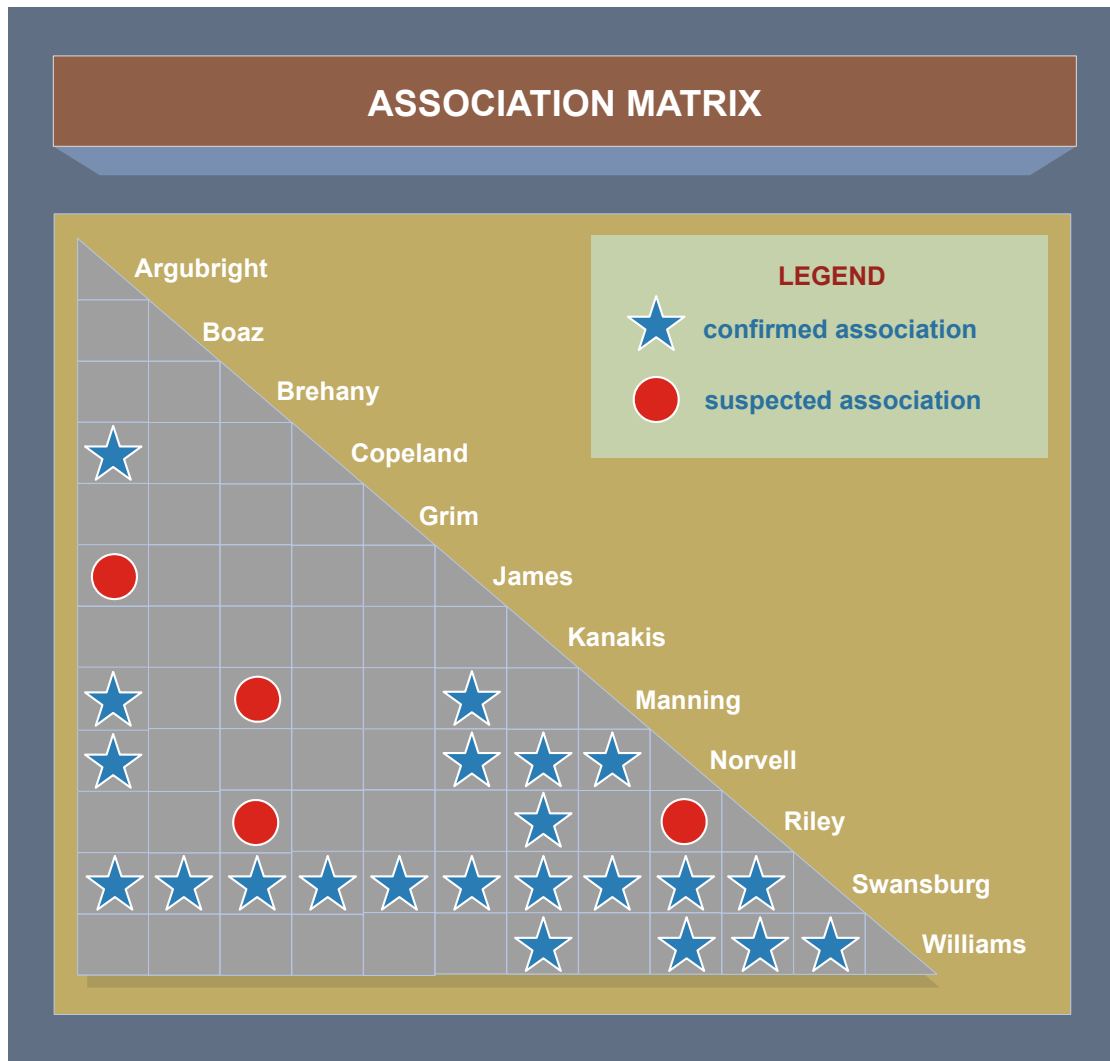


Figure D-10. Association Matrix

## 12. Link Diagram

Link diagrams graphically depict relationships between people, events, locations, or other factors deemed significant in any given situation (see Figure D-11). Link diagrams help analysts better understand how people and factors are interrelated in order to determine key links. Circles are used to represent people. Solid lines or dashed lines are used to indicate confirmed or suspected relationships respectively. Boxes, rectangles, and squares are used around circles to represent an individual's membership or association in a number of things such as an organization, cell, or event. Two boxes may overlap if an individual is associated with two organizations or events. If two individuals are placed within a box, their association is assumed and hence no line is needed between them. Crossing lines should be avoided as much as possible to preclude confusion.

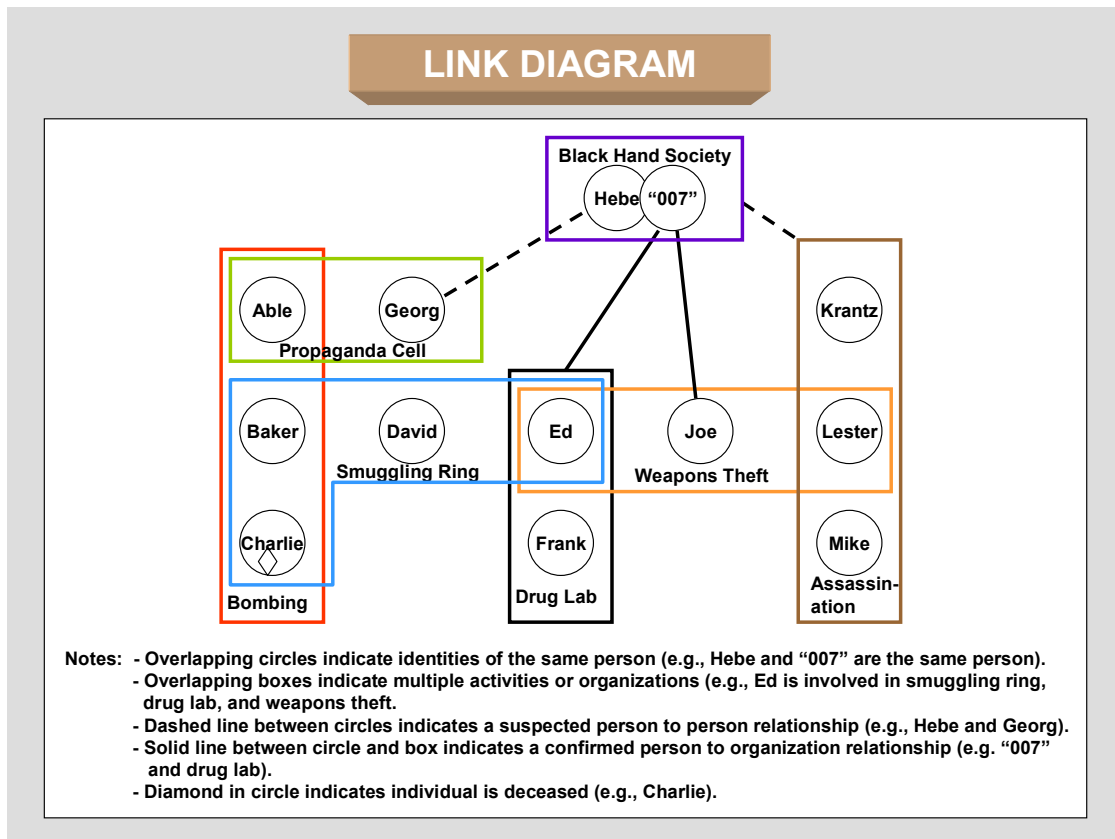


Figure D-11. Link Diagram

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## APPENDIX E

### REFERENCES

The development of JP 2-01.3 is based upon the following primary references.

#### 1. Department of Defense

- a. DOD Directive 5530.3, *International Agreements*.
- b. Military Standard-2525B, *Common Warfighting Symbology*.

#### 2. Chairman of the Joint Chiefs of Staff

- a. CJCSI 3900.01C, *Position (Point and Area) Reference Procedures*.
- b. CJCSM 3320.01B, *Joint Operations in the Electromagnetic Battlespace*.
- c. CJCSM 3500.04E, *Universal Joint Task Manual (UJTM)*.

#### 3. Joint Publications

- a. JP 1, *Doctrine for the Armed Forces of the United States*.
- b. JP 2-0, *Joint Intelligence*.
- c. JP 2-01, *Joint and National Intelligence Support to Military Operations*.
- d. JP 2-01.2, *Counterintelligence and Human Intelligence Support to Joint Operations*.
- e. JP 2-03, *Geospatial Intelligence Support to Joint Operations*.
- f. JP 3-0, *Joint Operations*.
- g. JP 3-01, *Countering Air and Missile Threats*.
- h. JP 3-05, *Doctrine for Joint Special Operations*.
- i. JP 3-06, *Joint Urban Operations*.
- j. JP 3-07.2, *Antiterrorism*.
- k. JP 3-07.3, *Peace Operations*.
- l. JP 3-07.4, *Joint Counterdrug Operations*.
- m. JP 3-08, *Interorganizational Coordination During Joint Operations*.
- n. JP 3-10, *Joint Security Operations in Theater*.



- o. JP 3-13, *Information Operations*.
- p. JP 3-13.1, *Electronic Warfare*.
- q. JP 3-13.2, *Psychological Operations*.
- r. JP 3-16, *Multinational Operations*.
- s. JP 3-22, *Foreign Internal Defense (FID)*.
- t. JP 3-24, *Counterinsurgency Operations*.
- u. JP 3-40, *Combating Weapons of Mass Destruction*.
- v. JP 3-59, *Meteorological and Oceanographic Operations*.
- w. JP 3-57, *Civil-Military Operations*.
- x. JP 3-60, *Joint Targeting*.
- y. JP 3-61, *Public Affairs*.
- z. JP 3-68, *Noncombatant Evacuation Operations*.
- aa. JP 4-0, *Joint Logistics*.
- bb. JP 5-0, *Joint Operation Planning*.
- cc. JP 6-0, *Joint Communications System*.

#### **4. Multi-Service Publications**

- a. Field Manual (FM) 3-01.16/Marine Corps Reference Publication 2-3C/Navy Tactics, Techniques, and Procedures 2-01.2/Air Force Tactics, Techniques, and Procedures (Instruction) 3-2.36, *Multi-Service Tactics, Techniques, and Procedures for Theater Missile Defense Intelligence Preparation of the Battlespace*.
- b. FM 3-24/Marine Corps Warfighting Publication (MCWP) 3-33.5, *Counterinsurgency*.

#### **5. Army Publications**

- a. FM 34-130, *Intelligence Preparation of the Battlefield*.
- b. FM 2-0, *Intelligence*.

c. FM 2-22.3, *Human Intelligence Collector Operations*.

d. FM 5-33, *Terrain Analysis*.

e. FM 30-10, *Military Graphic Intelligence*.

## **6. Marine Corps Publications**

a. Marine Corps Doctrine Publication 1, *Warfighting*.

b. MCWP 2-1, *Intelligence Operations*.

c. MCWP 2-12, *Marine Air-Ground Task Force (MAGTF) Intelligence Analysis and Production*.

## **7. Navy Publication**

Navy Doctrine Publication 2, *Naval Intelligence*.

## **8. Air Force Publications**

a. Air Force Doctrine Document 2-5.2, *Intelligence, Surveillance, and Reconnaissance Operations*.

b. Air Force Pamphlet 14-118, *Aerospace Intelligence Preparation of the Battlespace*.

## **9. General**

a. Medby, Jamison Jo and Russell W. Glenn. *Street Smarts: Intelligence Preparation of the Battlespace for Urban Operations*. Santa Monica, CA: The RAND Corporation, 2002.

b. Thomas, Troy S., Major, US Air Force, *Beneath the Surface: Intelligence Preparation of the Battlespace for Counterterrorism*. Washington, DC: Center for Strategic Intelligence Research, Joint Military Intelligence College, 2004.

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## APPENDIX F

### ADMINISTRATIVE INSTRUCTIONS

#### 1. User Comments

Users in the field are highly encouraged to submit comments on this publication to: Commander, United States Joint Forces Command, Joint Warfighting Center, ATTN: Doctrine Group, 116 Lake View Parkway, Suffolk, VA 23435-2697. These comments should address content (accuracy, usefulness, consistency, and organization), writing, and appearance.

#### 2. Authorship

The lead agent and Joint Staff doctrine sponsor for this publication is the Director for Intelligence (J-2).

#### 3. Supersession

This publication supersedes JP 2-01.3, 24 May 2000, *Joint Tactics, Techniques, and Procedures for Joint Intelligence Preparation of the Battlespace*.

#### 4. Change Recommendations

- a. Recommendations for urgent changes to this publication should be submitted:

TO: AFDC DET 1 LANGLEY AFB VA//CC// (LEAD AGENT)  
INFO: JOINT STAFF WASHINGTON DC//J-7-JEDD//  
CDRUSJFCOM SUFFOLK VA//DOC GP//

Routine changes should be submitted electronically to Commander Joint Warfighting Center, Doctrine and Education Group and info the Lead Agent and the Director for Operational Plans and Joint Force Development J-7/JEDD via the CJCS JEL at <http://www.dtic.mil/doctrine>.

b. When a Joint Staff directorate submits a proposal to the Chairman of the Joint Chiefs of Staff that would change source document information reflected in this publication, that directorate will include a proposed change to this publication as an enclosure to its proposal. The Services and other organizations are requested to notify the Joint Staff J-7 when changes to source documents reflected in this publication are initiated.

- c. Record of Changes:

CHANGE NUMBER	COPY NUMBER	DATE OF CHANGE	DATE ENTERED	POSTED BY	REMARKS

## **5. Distribution of Publications**

Local reproduction is authorized and access to unclassified publications is unrestricted. However, access to and reproduction authorization for classified joint publications must be in accordance with DOD Regulation 5200.1 R, *Information Security Program*.

## **6. Distribution of Electronic Publications**

a. Joint Staff J-7 will not print copies of JPs for distribution. Electronic versions are available on JDEIS at <https://jdeis.js.mil> (NIPRNET), and <https://jdeis.js.smil.mil> (SIPRNET) and on the JEL at <http://www.dtic.mil/doctrine> (NIPRNET).

b. Only approved joint publications and joint test publications are releasable outside the combatant commands, Services, and Joint Staff. Release of any classified joint publication to foreign governments or foreign nationals must be requested through the local embassy (Defense Attaché Office) to DIA Foreign Liaison Office, PO-FL, Room 1E811, 7400 Pentagon, Washington, DC 20301-7400.

c. CD-ROM. Upon request of a JDDC member, the Joint Staff J-7 will produce and deliver one CD-ROM with current joint publications.

## GLOSSARY

### PART I — ABBREVIATIONS AND ACRONYMS

AOI	area of interest
C2	command and control
CA	civil affairs
CBRN	chemical, biological, radiological, and nuclear
CCDR	combatant commander
CI	counterintelligence
CJCS	Chairman of the Joint Chiefs of Staff
CJCSI	Chairman of the Joint Chiefs of Staff instruction
CJCSM	Chairman of the Joint Chiefs of Staff manual
CMO	civil-military operations
CNA	computer network attack
CNO	computer network operations
COA	course of action
COG	center of gravity
CONOPS	concept of operations
CSA	combat support agency
DC	dislocated civilian
DFE	Defense Intelligence Operations Coordination Center forward element (DIA)
DIA	Defense Intelligence Agency
DIAP	Defense Intelligence Analysis Program
DIOCC	Defense Intelligence Operations Coordination Center (DIA)
DNI	Director of National Intelligence
DOD	Department of Defense
DOS	Department of State
DTA	dynamic threat assessment
EW	electronic warfare
EXORD	execute order
GCC	geographic combatant commander
GEOINT	geospatial intelligence
GI&S	geospatial information and services
GPE	geospatial intelligence preparation of the environment
HN	host nation
HPT	high-payoff target
HSI	hyperspectral imagery
HUMINT	human intelligence
HVT	high-value target

IC	intelligence community
IGO	intergovernmental organization
IO	information operations
IPB	intelligence preparation of the battlespace
ISR	intelligence, surveillance, and reconnaissance
IW	irregular warfare
J-2	intelligence directorate of a joint staff
J-3	operations directorate of a joint staff
J-4	logistics directorate of a joint staff
J-5	plans directorate of a joint staff
J-6	communications system directorate of a joint staff
J-7	operational plans and interoperability directorate of a joint staff
J-9	civil-military operations staff section
JFC	joint force commander
JFLCC	joint force land component commander
JIACG	joint interagency coordination group
JIOC	joint intelligence operations center
JIPOE	joint intelligence preparation of the operational environment
JISE	joint intelligence support element
JOA	joint operations area
JOPP	joint operation planning process
JP	joint publication
JSA	joint security area
JTF	joint task force
JWICS	Joint Worldwide Intelligence Communications System
LOC	line of communications
MCOO	modified combined obstacle overlay
METOC	meteorological and oceanographic
MILDEC	military deception
MIPOE	medical intelligence preparation of the operational environment
MOE	measure of effectiveness
MOP	measure of performance
MSI	multispectral imagery
NAI	named area of interest
NEO	noncombatant evacuation operation
NGO	nongovernmental organization
OB	order of battle
OGA	other government agency
OPLAN	operation plan
OPSEC	operations security



PIR	priority intelligence requirement
PMESII	political, military, economic, social, information, and infrastructure
PSYOP	psychological operations
RFI	request for information
ROE	rules of engagement
RUF	rules for the use of force
SIPRNET	SECRET Internet Protocol Router Network
SLCM	sea-launched cruise missile
SLOC	sea line of communications
SOF	special operations forces
STO	special technical operations
TAI	target area of interest
TTP	tactics, techniques, and procedures
UN	United Nations
US	United States
USG	United States Government
WMD	weapons of mass destruction

## PART II — TERMS AND DEFINITIONS

Unless otherwise annotated this publication is the proponent for all terms and definitions found in the glossary. Upon approval, JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*, will reflect this publication as the source document for these terms and definitions.

**adversary template.** A model based on an adversary's known or postulated preferred methods of operation illustrating the disposition and activity of adversary forces and assets conducting a particular operation unconstrained by the impact of the operational environment. (JP 1-02. SOURCE: JP 2-01.3) (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02)

**area of influence.** A geographical area wherein a commander is directly capable of influencing operations by maneuver or fire support systems normally under the commander's command or control. (JP 1-02. SOURCE: JP 3-16)

**area of interest.** That area of concern to the commander, including the area of influence, areas adjacent thereto, and extending into enemy territory to the objectives of current or planned operations. This area also includes areas occupied by enemy forces who could jeopardize the accomplishment of the mission. Also called **AOI**. (JP 1-02. SOURCE: JP 2-03)

**avenue of approach.** An air or ground route of an attacking force of a given size leading to its objective or to key terrain in its path. Also called **AA**. (JP 1-02. SOURCE: JP 2-01.3)

**battlespace.** None. (Approved for removal from JP 1-02.)

**center of gravity.** The source of power that provides moral or physical strength, freedom of action, or will to act. Also called **COG**. (JP 1-02. SOURCE: JP 3-0)

**collection planning.** A continuous process that coordinates and integrates the efforts of all collection units and agencies. (JP 1-02. SOURCE: JP 2-0)

**course of action.** 1. Any sequence of activities that an individual or unit may follow. 2. A possible plan open to an individual or commander that would accomplish, or is related to the accomplishment of the mission. 3. The scheme adopted to accomplish a job or mission. 4. A line of conduct in an engagement. 5. A product of the Joint Operational Planning and Execution System concept development phase and the course-of-action determination steps of the joint operation planning process. Also called **COA**. (JP 1-02. SOURCE: JP 5-0)

**cyberspace.** A global domain within the information environment consisting of the interdependent network of information technology infrastructures, including the

Internet, telecommunications networks, computer systems, and embedded processors and controllers. (JP 1-02. SOURCE: CJCS CM-0363-08)

**database.** Information that is normally structured and indexed for user access and review. Databases may exist in the form of physical files (folders, documents, etc.) or formatted automated data processing system data files. (JP 1-02. SOURCE: JP 2-0)

**decision support template.** A combined intelligence and operations graphic based on the results of wargaming. The decision support template depicts decision points, timelines associated with movement of forces and the flow of the operation, and other key items of information required to execute a specific friendly course of action. (JP 1-02. SOURCE: JP 2-01.3.) (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

**doctrinal template.** None. (Approved for removal from JP 1-02.)

**event matrix.** A description of the indicators and activity expected to occur in each named area of interest. It normally cross-references each named area of interest and indicator with the times they are expected to occur and the courses of action they will confirm or deny. There is no prescribed format. (JP 1-02. SOURCE: JP 2-01.3.)

**event template.** A guide for collection planning. The event template depicts the named areas of interest where activity, or its lack of activity, will indicate which course of action the adversary has adopted. (JP 1-02. SOURCE JP 2-01.3)

**geospatial information and services.** The collection, information extraction, storage, dissemination, and exploitation of geodetic, geomagnetic, imagery (both commercial and national source), gravimetric, aeronautical, topographic, hydrographic, littoral, cultural, and toponymic data accurately referenced to a precise location on the Earth's surface. Geospatial services include tools that enable users to access and manipulate data, and also include instruction, training, laboratory support, and guidance for the use of geospatial data. Also called **GI&S**. (JP 1-02. SOURCE: JP 2-03)

**geospatial intelligence.** The exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. Geospatial intelligence consists of imagery, imagery intelligence, and geospatial information. Also called **GEOINT**. (JP 1-02. SOURCE: JP 2-03)

**high-payoff target.** A target whose loss to the enemy will significantly contribute to the success of the friendly course of action. High-payoff targets are those high-value targets that must be acquired and successfully attacked for the success of the friendly commander's mission. Also called **HPT**. (JP 1-02. SOURCE: JP 3-60)

**high-value target.** A target the enemy commander requires for the successful completion of the mission. The loss of high-value targets would be expected to

seriously degrade important enemy functions throughout the friendly commander's area of interest. Also called **HVT**. (JP 1-02. SOURCE: JP 3-60)

**human intelligence.** A category of intelligence derived from information collected and provided by human sources. Also called **HUMINT**. (JP 1-02. SOURCE: JP 2-0)

**imagery intelligence.** The technical, geographic, and intelligence information derived through the interpretation or analysis of imagery and collateral materials. Also called **IMINT**. (JP 1-02. SOURCE: JP 2-03)

**indicator.** In intelligence usage, an item of information which reflects the intention or capability of an adversary to adopt or reject a course of action. (JP 1-02. SOURCE: JP 2-0)

**information environment.** The aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information. (JP 1-02. SOURCE: JP 3-13)

**information requirements.** In intelligence usage, those items of information regarding the adversary and other relevant aspects of the operational environment that need to be collected and processed in order to meet the intelligence requirements of a commander. (JP 1-02. SOURCE: JP 2-0)

**intelligence estimate.** The appraisal, expressed in writing or orally, of available intelligence relating to a specific situation or condition with a view to determining the courses of action open to the enemy or adversary and the order of probability of their adoption. (JP 1-02. SOURCE: JP 2-0)

**intelligence preparation of the battlespace.** The analytical methodologies employed by the Services or joint force component commands to reduce uncertainties concerning the enemy, environment, time, and terrain. Intelligence preparation of the battlespace supports the individual operations of the joint force component commands. Also called **IPB**. (JP 1-02. SOURCE: JP 2-01.3) (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

**intelligence requirement.** 1. Any subject, general or specific, upon which there is a need for the collection of information, or the production of intelligence. 2. A requirement for intelligence to fill a gap in the command's knowledge or understanding of the operational environment or threat forces. (JP 1-02. SOURCE: JP 2-0)

**joint intelligence preparation of the battlespace.** None (Approved for removal from JP 1-02.)

**joint intelligence preparation of the operational environment.** The analytical process used by joint intelligence organizations to produce intelligence estimates and other intelligence products in support of the joint force commander's decision-making process. It is a continuous process that includes defining the operational environment;

describing the impact of the operational environment; evaluating the adversary; and determining adversary courses of action. Also called **JIPOE**. (JP 1-02. SOURCE: JP 2-01.3) (Approved for inclusion in JP 1-02.)

**key terrain.** Any locality, or area, the seizure or retention of which affords a marked advantage to either combatant. (JP 1-02. SOURCE: JP 2-01.3)

**line of communications.** A route, either land, water, and/or air, that connects an operating military force with a base of operations and along which supplies and military forces move. Also called **LOC**. (JP 1-02. SOURCE: JP 2-01.3)

**littoral.** The littoral comprises two segments of operational environment: 1. Seaward: the area from the open ocean to the shore, which must be controlled to support operations ashore. 2. Landward: the area inland from the shore that can be supported and defended directly from the sea. (JP 1-02. SOURCE: JP 2-01.3) (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

**maritime domain.** The oceans, seas, bays, estuaries, islands, coastal areas, and the airspace above these, including the littorals. (JP 1-02. SOURCE: JP 3-32)

**measurement and signature intelligence.** Intelligence obtained by quantitative and qualitative analysis of data (metric, angle, spatial, wavelength, time dependence, modulation, plasma, and hydromagnetic) derived from specific technical sensors for the purpose of identifying any distinctive features associated with the emitter or sender, and to facilitate subsequent identification and/or measurement of the same. The detected feature may be either reflected or emitted. Also called **MASINT**. (JP 1-02. SOURCE: JP 2-0)

**measure of effectiveness.** A criterion used to assess changes in system behavior, capability, or operational environment that is tied to measuring the attainment of an end state, achievement of an objective, or creation of an effect. Also called **MOE**. (JP 1-02. SOURCE: JP 3-0)

**measure of performance.** A criterion used to assess friendly actions that is tied to measuring task accomplishment. Also called **MOP**. (JP 1-02. SOURCE: JP 3-0)

**mobility corridor.** Areas where a force will be canalized due to terrain restrictions. They allow military forces to capitalize on the principles of mass and speed and are therefore relatively free of obstacles. (JP 1-02. SOURCE: JP 2-01.3)

**modified combined obstacle overlay.** A joint intelligence preparation of the operational environment product used to portray the militarily significant aspects of the operational environment, such as obstacles restricting military movement, key geography, and military objectives. Also called **MCOO**. (JP 1-02. SOURCE: JP 2-01.3) (This term

and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

**named area of interest.** A geospatial area or systems node or link against which information that will satisfy a specific information requirement can be collected. Named areas of interest are usually selected to capture indications of adversary courses of action, but also may be related to conditions of the operational environment. Also called **NAI**. (JP 1-02. SOURCE: JP 2-01.3) (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

**operational environment.** A composite of the conditions, circumstances, and influences that affect the employment of capabilities and bear on the decisions of the commander. (JP 1-02. SOURCE: JP 3-0)

**order of battle.** The identification, strength, command structure, and disposition of the personnel, units, and equipment of any military force. Also called **OB**; **OOB**. (JP 1-02. SOURCE: JP 2-01.3)

**priority intelligence requirement.** An intelligence requirement, stated as a priority for intelligence support, that the commander and staff need to understand the adversary or other aspects of the operational environment. Also called **PIR**. (JP 1-02. SOURCE: JP 2-0)

**reconnaissance.** A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area. Also called **RECON**. (JP 1-02. SOURCE: JP 2-0)

**red team.** An organizational element comprised of trained and educated members that provide an independent capability to fully explore alternatives in plans and operations in the context of the operational environment and from the perspective of adversaries and others. (JP 1-02. SOURCE: JP 2-0)

**request for information.** Any specific time-sensitive ad hoc requirement for intelligence information or products to support an ongoing crisis or operation not necessarily related to standing requirements or scheduled intelligence production. A request for information can be initiated to respond to operational requirements and will be validated in accordance with the combatant command's procedures. Also called **RFI**. (JP 1-02. SOURCE: JP 2-0)

**signals intelligence.** 1. A category of intelligence comprising either individually or in combination all communications intelligence, electronic intelligence, and foreign instrumentation signals intelligence, however transmitted. 2. Intelligence derived from communications, electronic, and foreign instrumentation signals. Also called **SIGINT**. (JP 1-02. SOURCE: JP 2-0)

**situation template.** A depiction of assumed adversary dispositions, based on that adversary's preferred method of operations and the impact of the operational environment if the adversary should adopt a particular course of action. (JP 1-02. SOURCE: JP 2-01.3) (This term and its definition modify the existing term and its definition and are approved for inclusion in JP 1-02.)

**sociocultural factors.** The social, cultural, and behavioral factors characterizing the relationships and activities of the population of a specific region or operational environment. (JP 1-02. SOURCE: JP 2-01.3) (Approved for inclusion in JP 1-02.)

**surveillance.** The systematic observation of aerospace, surface or subsurface areas, places, persons, or things, by visual, aural, electronic, photographic, or other means. (JP 1-02. SOURCE: JP 3-0)

**target.** 1. An entity or object considered for possible engagement or other action. 2. In intelligence usage, a country, area, installation, agency, or person against which intelligence operations are directed. 3. An area designated and numbered for future firing. 4. In gunfire support usage, an impact burst that hits the target. (JP 1-02. SOURCE: JP 3-60)

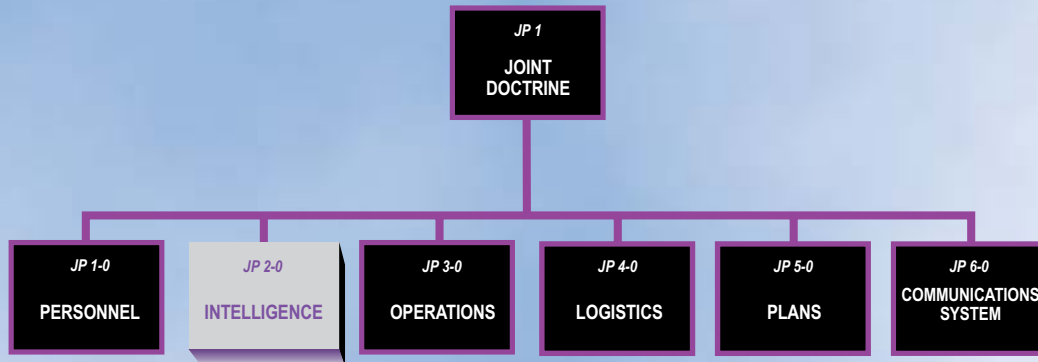
**target area of interest.** The geographical area where high-value targets can be acquired and engaged by friendly forces. Not all target areas of interest will form part of the friendly course of action; only target areas of interest associated with high priority targets are of interest to the staff. These are identified during staff planning and wargaming. Target areas of interest differ from engagement areas in degree. Engagement areas plan for the use of all available weapons; target areas of interest might be engaged by a single weapon. Also called **TAI**. (JP 1-02. SOURCE: JP 2-01.3)

**technical intelligence.** Intelligence derived from the collection, processing, analysis, and exploitation of data and information pertaining to foreign equipment and material for the purpose of preventing technological surprise, assessing foreign scientific and technical capabilities, and developing countermeasures designed to neutralize and adversary's technological advantages. Also called **TECHINT**. (JP 1-02. SOURCE: JP 2-0)



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# JOINT DOCTRINE PUBLICATIONS HIERARCHY



All joint publications are organized into a comprehensive hierarchy as shown in the chart above. **Joint Publication (JP) 2-01.3** is in the **Intelligence** series of joint doctrine publications. The diagram below illustrates an overview of the development process:

